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ON ARBUTIN, THE BITTER PRINCIPLE OF THE COWBERRY (VACCINIUM VITIS-IDÆA, LIN.).

BY EDO CLAASSEN.

In this Journal (July number, 1870), I announced the existence of a bitter principle, vacciniin, in the leaves (resp. the whole plant) of the cowberry, and described its preparation from the same.

At the same time I also published several properties of it, but could not then give the matter a thorough investigation. It was not until now that I had leisure to continue the examination, and to state that the bitter principle found in that plant is not a peculiar one, but identical with another already known, viz., with arbutin, the bitter principle occurring in several other ericaceous plants, particularly in Arbutus Uva Ursi, *Lin.* In order to come to the above conclusion, a series of tests were made with the above vacciniin, and these were compared with tests made with arbutin prepared for this purpose from the leaves of Arbutus Uva Ursi, *Lin.*

Before describing these tests I may be allowed to say that there was no difference perceptible either in the form and shape of the crystals of both these bitter substances under the microscope (they form four and six sided prisms, with a doma, *i. e.*, two planes, sharpening their ends), nor in their solubility in water, alcohol and ether, and also not in their bitter taste.

The tests made were the following:

1. Heated on platinum foil, both melt to a clear liquid (which by and by turns black), and are entirely consumed by increased heat.

2. Heated in a glass tube, both melt at first, then turn black, and give off fumes of a peculiar smell and of acid reaction.

3. Concentrated sulphuric acid, and also hydrochloric acid, dissolve both without color.

4. Concentrated nitric acid colors both orange, then dissolves them

under evolution of red fumes, forming a reddish yellow solution, which after dilution with water is yellow.

5. The solutions of both in water are not precipitated by an alkaline copper solution, platinum chloride, corrosive sublimate, acetate and basic acetate of lead, a solution of iodine in potassium iodide, tannic and gallic acids.

6. A very dilute solution of ferric chloride colors both blue; they give then with water a blue solution.

7. A solution of phosphomolybdic acid and ammonia added to their solutions produces an intensely blue colored liquid, which after some time turns greenish, and after a longer time the color disappears entirely.

8. The solutions of both boiled for some time with very dilute sulphuric acid, then made alkaline by potassium hydrate and heated with an alkaline copper solution, furnish a deposit of copper protoxide (by the glucose formed).

When preparing arbutin, it is, as I have found, of value to see that the liquid containing it when evaporated has no acid reaction; the acid in it may be sulphuric, hydrochloric, citric or acetic acid, because they decompose the same, as experiments made (see below sub 1 and 2) will prove. In order to avoid this decomposition, and to collect the whole amount of the arbutin present, it is necessary, after having precipitated the decoction of the leaves by basic acetate of lead, and the filtrate by sulphuretted hydrogen, to neutralize the free acetic acid by calcium or magnesium carbonate.

1. 0·2 gram of pure arbutin, dissolved in 20 cubic centimeters of diluted (5 per cent.) acetic acid, gave, after 15 minutes' boiling in a flask (meanwhile restoring from time to time the evaporated water) with an alkaline copper solution, a plainly visible reaction of glucose; after ½ hour's boiling the amount of glucose had increased considerably.

2. 0·2 gram of pure arbutin boiled in the same manner with 20 cubic centimeters of water, containing 3 per cent. of citric acid, gave a fair reaction of glucose after a lapse of 10 minutes already.

Before closing this article I will mention that the fruit of the American cranberry, of which enormous quantities arebrought into the market, has besides an acid a decidedly bitter taste. A small quantity of the berries was crushed under addition of water and an excess of quick lime, the mixture pressed, and the liquid filtered. The filtrate gave

with ammonia and phosphomolybdic acid the above described blue color. Crystals of arbutin, however, could not be obtained, which was probably due to the very small amount of it present in the small sample of berries. If the blue color formed in liquids by ammonia and phosphomolybdic acid is, as is suggested in this Journal, characteristic for the presence of arbutin, there can be no doubt that the formation of it in the filtered juice of the American cranberries proves the presence in them of this bitter principle.

NOTE BY THE EDITOR.—The above paper is an interesting and important one, on a subject of phytochemistry which has received considerable attention in previous volumes of this Journal. Thus far the existence of arbutin has been proven for the leaves of a number of sempervirent species of the groups Ericineæ and Pyroleæ, of the natural order of Ericaceæ; Mr. Claassen's paper shows the same principle also to exist in the leathery leaves of a plant of the group Vaccineæ, thus rendering it more probable that arbutin may be found in all ericaceous plants, at least in those with leathery leaves. In 1871 ("Am. Jour. Phar.," 1871, p. 235) we pointed out the possibility of the identity of vacciniin with arbutin. When, in 1874 (*Ibid.*, 1874, p. 315), we thought the former might possibly be calcium kinate, we overlooked Mr. Claassen's statement (*Ibid.*, 1870, p. 208), that the principle is *not* precipitated by subacetate of lead; moreover, calcium kinate crystallizes in a different form (four-sided scales), is insoluble in alcohol, and is tasteless. We are indebted to Mr. Claassen for specimens of both principles.

The results obtained as above make it of interest to ascertain the behavior of the leaves of the American cranberry, an investigation which Mr. Claassen informs us he will soon undertake.

Choline in Hops.—Drs. Griess and G. H. Harrow have separated choline, $C_2H_4(OH).NMe_3.OH$, from hops by adding to a concentrated extract, acidified with chlorhydric acid, a solution of iodine in iodhydric acid. The semi-solid precipitate obtained, a choline periodide was boiled with water to expel iodine, and the resulting solution of choline iodide treated with silver oxide; the impure choline in the solution was then converted into the auro-chloride, which was recrystallized. In this manner they have not been able to obtain more than $\frac{1}{50}$th per cent. of choline from hops. They consider it not improbable that it exists in loose combination with resin, as they find that a very dilute aqueous solution is capable of dissolving comparatively large quantities of hop resin, the liquid being then of an intensely bitter taste. Employing the same method, they have also extracted choline from beer.—*Chem. News*, March 27, 1885, p. 149.

OHIO WINE, ARGOLS AND COMMERCIAL TARTARIC ACID.

By James O. Howells, Ph. G.

From an Inaugural Essay.

The cultivation of the grape and the making of wine have become important industries in this country, and several of our States like California, New York and Ohio, have made such progress as to have attained no little notice from the annual production of enormous quantities of this fruit. I shall speak more of the Ohio culture as I was privileged to obtain the information from Ohio wine growers. With the review I also append the result of an examination of argols obtained from the Ohio wine, and of tartaric acid as found in commerce.

The chemical work was done in the laboratory connected with the Philadelphia College of Pharmacy.

The choice of land in selecting a location for planting a vineyard is usually the hillside flanking a river, and having loose, warm soil and a southern exposure. An abundance of sunlight is a necessity, while the hill serves as a shelter, to the growth, from strong winds. Sudden changes of temperature are to be guarded against, and this also is a consideration in the selection. The planting is usually done by "cuttings" consisting of a portion of the old stem and a branch of the previous year's growth. These are placed in a series of rows six or eight feet apart and about the same distance between each cutting. During the fruiting season the vines become so heavy that artificial support has to be given them, which is accomplished by means of four or five wires strung along in rows attached to posts, much similar to the modern barbed wire fence.

In the months of March and April as the sap is beginning to flow the vines are trimmed, this being done to give it strength and it bears more fruit if cultivated. If left alone the branches would throw out long slender tendrils that only take the sustenance from the vine with no return, as the climbing and support, the office of the tendrils, is done artificially. The trimmed branches are tied to the wires by the use of willow shoots, this operation being done once or twice during the summer. The flowers appear about the month of June, and the fruit ripens during September and October. The fruit for most uses is gathered when fully ripe; for its excellent flavor is best appreciated at

that stage, either for table use or making wine. When shipment is done, however, the fruit is gathered scarcely ripe as it withstands transportation much better. European growers have a method of hastening maturity of the grapes which consists of removing the bark about half an inch long just below the cluster of fruit. This not only hastens the ripening, but increases the size sometimes to the extent of fifty per cent. The fruit certainly has a superior appearance, but at the loss of quality. This custom has not been used to any extent in this country, as it has been almost conclusively proven that it injures the plant.

The cultivation was established at an early date in the vicinity of Cincinnati where it is still continued very extensively. The northern part of the State also claims recognition for its production as well as the valley of the Ohio, especially the counties of Jefferson, Belmont and Lawrence.

The age of the grapevines is not distinctly marked as in the case of many trees, but that they attain great age is an undisputed fact; for we have record of vines from one to four hundred years old. Pliny names a vine six hundred years old.

In the manufacture of wines the method adopted is very simple, but yet requiring much practical knowledge. The grape mostly used is the Catawba, but there are many others used, especially the Delaware and Concord. The Catawba grape does not ripen very early, but its excellence has given to its wines the high standing they hold. The bunches are above the medium, moderately compact, berries round, firm and of a deep red color, the skin thick, the flesh juicy and of a rich vinous taste. The Concord grape has large compact bunches, the berries round, large and black with a bluish bloom; the skin is thin, the flesh sweet, but somewhat acrid in the center. They ripen about two weeks earlier than the Catawba. The Delaware grapes as wine grapes deserve praise. The bunches are below the medium, very compact, the berry small, round and having a beautiful rose color, with a thin skin and a very sweet pulp. This variety ripens the earliest.

In the making of wine to obtain a good article care must be taken in the selection of the grapes. In gathering and assorting them the unripe and decayed ones are rejected and the ripe ones deprived of the stems. The grapes thus obtained are placed in a large hopper above two large wooden rollers, through which they are passed into a large vat below placed there for holding the crushed grapes. The crushing is done to break the skin and press the juice from the pulp, care being

used not to crush the seeds. Before expression the juice from the crushed mass is allowed to remain in the vat for about eighteen or thirty-six hours, during which time a slight fermentation has commenced. When this has continued a sufficient length of time the free juice is drawn off and the remaining mass is placed under a huge press for further expression. This is the white wine method and differs from that of obtaining the red wine only in allowing fermentation in the presence of the skins. The entire juice thus obtained is placed in large oak casks made for this purpose, holding from eight hundred to fifteen hundred gallons—one that I saw was of twenty-two hundred gallons capacity—which are filled to within two or three inches of the top the bung being put in loosely. The casks are kept in immense cellars at a temperature of about 15° C., which allows fermentation to go on quietly. At first the change is rather violent during which all the fibrous and inert matter settles to the bottom of the cask. This sediment is called "lees." They contain but a small percentage of impure tartar so that they are of no value commercially and are thrown away as refuse.

The clear wine is drawn off or "racked," which process consists of transferring the clear wine to another cask where after about three months standing this process is again gone over. This is done about three times during the first year, and it is from the second and subsequent "rackings" that we obtain the argols. During the continued fermentation of the new wine the gradual deposition of the insoluble portion takes place, consisting mainly of impure calcium tartrate and acid potassium tartrate. The yield is quite small when compared to the great bulk of wine for after about four months, the deposit is only enough to give the interior of the cask a crystalline appearance. These argols obtained are not used by the manufacturer for the reason of the small amount produced. On casks which have stood for years undisturbed the deposit is two or three inches in thickness, but owing to our native wine being sold when comparatively new no opportunity is given for such deposits.

The wine thus obtained is known as "dry wine," and is that mostly sold as native wine. The same object is accomplished by bottling the "must" when first obtained, and after the required time has been allowed for the foreign matter to deposit on the side of the bottle the wine is transferred to another bottle and securely corked, age ripening its flavor. During the year 1881, 10,642 acres of land were under

cultivation, yielding 11,678,545 pounds of grapes, from which 884,-895 gallons of wine was made. In 1882, 18,526,219 pounds were grown and 1,296,295 gallons of wine made.

I obtained from one of the largest wine growers in the State a sample of the argols from Catawba (white) wine and one from Concord (red) wine, which were estimated for the percentage of tartaric acid by the scheme given in "Allen's Commercial Organic Analysis." This consists of digesting an amount of the sample in powder, supposed to contain about 2 grammes of tartaric acid, with water until thoroughly softened. A strong solution of neutral potassium oxalate is next added in sufficient quantity to react with all the calcium salt present and leave an excess of about 1·5 gm. of the salt, and the mixture is heated, with frequent stirring, for some time. The solution, which generally is strongly acid, is carefully neutralized with solution of potash. After a little further heating the liquid—which should not occupy more than 40 cc.—is filtered on a small filter, the residue well washed and the washings concentrated and added to the main solution which is made up to about 50 cc. A strong solution of about 2 gm. of citric acid is added, the liquid being well stirred. After twelve hours the precipitate is collected and washed with a saturated solution of acid potassium tartrate, containing about five per cent. of potassium chloride. The filter and contents are removed to a beaker dissolved in hot water and treated with standard alkali. Each cc. of normal alkali equals ·150 gm. of tartaric acid.

Three estimations of the red wine argols gave 51·57, 53·57 and 52·8 per cent., an average of 52·65 per cent. Three estimations of those of the white wine gave 69·, 66·3 and 70·2 per cent., an average of 68·5 per cent. The white argols give 27·53 per cent. of ash and the red argols 16·43 per cent. The precipitate with potassium oxalate in the percentage estimation of the white argols gives 20·4 per cent. of ash, the red wine argols 10·18 per cent. A solution of the argols in hydrochloric acid shows the presence of potassium, calcium with a trace of magnesium and iron in that from white wine; that from the red wine only potassium and calcium.

Five samples of tartaric acid were next estimated. Three were of known make, one of these (No. 3) being in crystals, and two (Nos. 4 and 5) unknown. The samples known are from the leading manufacturing chemists and will thus give a fair estimation of the purity of the commercial article.

With a decinormal solution of soda number one gives 99·43 per cent., number two 99·42 per cent., number three 99·75 per cent., number four 99·50 per cent, number five 99·49 per cent., an average of 99·518 per cent. Number three was estimated twice. The Pharmacopœia requirement that "on ignition they should leave not more than ·05 per cent. of ash" was next tried with the following results; Number one ·08 per cent., number two ·06 per cent., number three ·07 per cent., number four ·06 per cent., number five ·06 per cent., an average of ·066 per cent., thus being a little above the requirement. The result with number one being the highest, it was estimated twice thus giving confirmatory proof that the work was correct. Only a trace of moisture was found in three of the samples when heated to 100° C. until a constant weight was obtained.

The ash of all were found to be free from copper by treatment with a few drops of water of ammonia, nor on the addition of one drop of ammonium sulphide was lead or iron found. No precipitate was shown after five minutes on the addition of 1 cc. of test solution of barium chloride to 10 cc. of a concentrated solution of the acid with excess of hydrochloric acid, and after about ten minutes was any cloudiness noticed. The ash of number four was tinted brown, but did not given any reaction with water of ammonia or ammonium sulphide.

Summing up the above results commercial tartaric acid from reliable sources is certainly very pure, and with the exception of leaving a slight amount of ash more and falling a little below in its percentage of acid, fills the requirements of the Pharmacopœia.

Alveloz is the name of a plant which has been sent by the American Consul at Pernambuco to the State Department, with the statement that it belongs to the euphorbiaceæ, and that several cases of alleged cancer had been cured by its application. Unlike cundurango, which was an alleged internal remedy for cancer and syphilis, alveloz is an external application. Its mode of operation is similar to that of jequirity. A profuse suppuration follows its application to a granular surface. The drug was used in Washington by Dr. Smith Townshend in a case of lupus of the nose, which was of nearly forty years' standing, and had resisted all previous treatment. The ulcer was cured within a few days.—*N. Y. Med. Jour.*

NOTE ON DOVER'S SOLUTION.

By A. B. Lyons, M.D.

The publication in your journal of a paper like that of E. H. Hess in your May issue, insures for the opinions therein stated a wide circulation, besides giving them a quasi endorsement. I therefore desire to criticise through your columns the concluding paragraph of the paper in question.

The writer states that he has made some physiological experiments upon a cat with the familiar combination of morphine and ipecac which, in a new form, is the subject of his thesis, finding that in overdoses it "produced emesis with general exhaustion, but no alarming symptoms." From these experiments he concludes that the Dover's solution is "almost a harmless preparation, as an overdose is almost certain to produce emesis." I need not point out the importance, in drawing conclusions from physiological experiments, of keeping well in mind the fact that different animals are affected in very different ways, and in very different degrees by toxic agents. A mixture containing in each fluidounce six grains of morphine acetate and the equivalent of *four grains* of ipecac might be an emetic for a cat, but I should be very greatly surprised to find it capable of producing any such effect in a human subject. It must be remembered that the effect of morphine is to counteract powerfully the action of ordinary emetics, and ipecac alone in a dose of as much as four grains would not generally do more than to produce slight nausea.

We have already too many preparations of opium of varying strength. That now proposed agrees very well in morphine strength with the fluid Dover's powder (tincture of ipecacuanha and opium) of the U. S. Pharmacopœia and with the other officinal tinctures of opium, but the relative proportion of ipecac is very much smaller than in any of the numerous formulas in general or local use.

If we must have a second form of fluid Dover's powder, let us at least have the composition and the dose the same as that of preparations already recognized by our standard authority.

Detroit, Mich., May 27, 1885.

For Fixed Dressing for Joints, requiring rest, Dr. Levis uses the following, which is painted over roller bandages or cloth, applied to the part: Glue, lb. i.; oxide of zinc, lb. ss.; water, Cong. ss.—*Coll. and Clin. Record.*

ON SOME USEFUL PLANTS OF THE NATURAL ORDER OF VERBENACEÆ.

By John M. Maisch.

Read before the Pennsylvania Pharmaceutical Association, June 3, 1885.

A comparison of the drugs recognized by the Pharmacopœia of a foreign country with those admitted into the Pharmacopœia of the United States frequently reveals the fact that certain plants indigenous to or commonly cultivated in both these countries may have been deemed of sufficient importance for official recognition in one, while they are little used in the other. Such a comparison very naturally invites also to a closer inquiry into the usefulness of other plants which are botanically allied to those yielding officinal drugs. Among the pharmacopœias which have been published during the past few years, those of France (Codex medicamentarius, Paris, 1884) and of Mexico (Nueva Farmacopea Mexicana, Mexico, 1884), are the most comprehensive in having admitted numerous drugs of vegetable origin which are comparatively unknown here. Inquiries in the direction pointed out before show that, in many cases, these drugs are the representatives of a much larger number derived from plants of the same natural order which were formerly employed in medicine, or are in popular use in their native countries as medicinal agents; and that in the same order other plants are found which are more or less valuable in the arts.

In laying before you some of the results of my inquiry, a natural order has been selected which has thus far not yielded any drug possessing very important medicinal properties, but which, nevertheless seems to be deserving of some attention, inasmuch as a number of the plants are very commonly cultivated for ornamental purposes, while a limited number of mostly homely weeds are indigenous to our country.

The natural order of verbenaceæ comprises in the neighborhood of seven hundred species, which are mostly indigenous to tropical countries, only few species being at home in the temperate zones. The tropical species are mostly trees or shrubs, and are frequently aromatic, while the species of temperate climes are usually herbaceous and not fragrant, at least not to the same degree as many of those growing in the tropics.

One of the most important species is the East Indian *teak tree*, Tectona grandis, *Lin. fil.*, which grows in Hindoostan, Siam and the

Malayan Islands, attaining a height of over eighty feet, and a thickness of more than four feet. The oval or elliptic and entire leaves are two or three feet long, and are said to be useful for polishing wood owing to their roughness; they have an acidulous astringent and bitterish taste, and are employed for their mild astringent properties, and as a purple dye. The small white flowers are fragrant, and are believed to possess diuretic properties. But the most valuable portion is the wood which on account of its hardness and durability is largely used in ship-building, and in the East also for temples and dwellings. It is of a light brown color, resinous, porous, yet heavy, a cubic foot of it weighing from forty to fifty pounds; it is nearly indestructible in water, is not attacked by worms, and far excels the best oak wood in durability. According to G. Thoms, the air dry wood yields 2·15 per cent. of ash, consisting chiefly of calcium phosphate and silica. The African teak, which is likewise valuable for its timber, is a euphorbiaceous tree, Oldfieldia africana.

Gmelina arborea, *Roxburgh*, is likewise an East Indian tree, the root of which has been employed in gout, and the bark in intermittent fevers. The smaller species Gmelina parvifolia, *Roxburgh*, and Gm. asiatica, *Lin.*, possess demulcent properties, the leaves and the root being employed.

Avicennia tomentosa, *Lin.*, a medium sized resinous tree, has also a mucilaginous root, while the unripe fruit has been employed as an emollient cataplasm. The allied A. nitida, *Jacquin* is known in the West Indies as *black* or *olive mangrove;* the bark is called *courida bark*, and is used in tanning.

Clerodendron infortunatum, *Lin.*, is an East Indian shrub, the leaves and root of which are employed externally for tumors and certain skin diseases, and internally as tonics. The root of Clerodendron inerme, *R. Brown*, is of a more decided bitter taste and strong odor, and is regarded as possessing tonic and alterative properties, and as being useful in venereal and scrofulous complaints.

Of the genus Vitex, popularly known as *chaste-tree*, two or three shrubby species are not unfrequently cultivated in this country, namely, V. Negundo, V. incisa and V. Agnus-casti, *Lin.*, the former two being indigenous to Asia, the last one to the basin of the Mediterranean. This is about ten feet or more high, has opposite ascending brownish gray or greenish, obtusely quadrangular downy branches and palmate, on the lower side downy leaves with five or seven lanceo-

late acute and entire leaflets; the bluish, purplish or whitish fragrant flowers are in sessile clusters at the end of the branches, forming an interrupted spike ten inches or more in length; the fruit is globular, blackish-brown, of about the size of black pepper, four-celled and four-seeded, and has a rather strong aromatic, somewhat narcotic odor, particularly when rubbed, and a peppery taste. The leaves are likewise pungent, and were formerly employed in many diseases as a stimulent and irritant; the fruit, however, was more frequently used for similar purposes, also as a spice in place of pepper, under the incorrect name of *semen agni casti*. Landerer (1835) found in the fruit a volatile principle, acrid and acid oil and a crystalline principle of a bitter taste, soluble in alcohol and partly soluble in acetic acid, which solutions are precipitated by alkalies and by tannin. The principle has been named *viticin* and *castin*, but its true nature has not been determined. The other species of vitex are likewise somewhat stimulating; those of the West Indies and others are arboreous, some of them being valuable for timber. The fruit of Vitex trifolia, *Lin.* is called in India *wild pepper*.

The genus Lantana of tropical America is well known in our gardens and represented by a number of species bearing bright-colored showy flowers, which often change in color before they fade. Thus the prickly L. Camara, *Lin.*, a native of the West Indies and of South America, northward to our Gulf States, has deep golden yellow flowers, changing to orange color and scarlet. L. nivea, *Ventenat*, in some of its varieties changes its white flowers to blue. L. mixta, *Lin.*, like the preceding species indigenous to Brazil, has also white flowers the color of which passes through different shades of yellow and orange to red. Many hybrids have been produced by gardeners from these and other species, and are characterized by the striking mutation of the color of their flowers. The herbaceous portion of the lantanas is more or less agreeably aromatic, and is popularly employed in the native countries of the different species for its sudorific action and externally in fomentations and cataplasms. In addition to the species mentioned, L. odorota, *Lin.*, L. involucrata, *Lin.*, and L. trifolia, *Lin.*, may be enumerated which with others are known in the West Indies as *wild sage*. L. Pseudo-thea, *Saint-Hilaire*, is probably the most important species, it being used in Brazil in place of Chinese tea, but whether it also contains theine has not been ascertained; the plant is known in

Brazil as *capitão da matto* (Bentley), and as *chá de frade*, or *chá de pedestre* (Peckolt).

The widely distributed Lippia (Zapania, *Lamarck*), nodiflora, *Richard*, is a procumbent or ascending perennial with small whitish, yellowish or reddish flowers, possesses mild aromatic and tonic properties, and has also been employed as an antispasmodic and against snake bites. It grows in most tropical countries and is frequently met with in our Southern States in damp localities. It is known as *fogfruit* like the closely allied Lippia lanceolata, *Michaux*, which is a weed extending northward into Pennsylvania, Ohio and Illinois, and westward to Colorado.

The so-called *lemon verbena*, Lippia (Aloysia, *Ortega*), citriodora, *Kunth*, s. Verbena triphylla, *L'Heritier*, is a well-known ornamental shrub of our gardens and conservatories, indigenous to Peru and other parts of South America. In Mexico it is officinal under the name of *cedron*, and in France as *verveine odorante*, also known as *verveine-citronelle*. Oliva who examined the plant found in it, besides volatile oil, the usual common constituents of plants like sugar, gum, fat, tannin and coloring-matter. It is employed as an antispasmodic.

Dr. Podwissotzki ("Phar. Zeitschr. Russl.," 1883, p. 920) has submitted the herb of Lippia mexicana to analysis, and obtained tannin, a quercetin-like crystalline principle, liquid volatile oil of a lemon-like odor, and *lippiol*, a camphor melting between 25° and 30°C., having the composition of menthol, and representing the medicinal activity of the plant; it acts as a diaphoretic, nauseant and soporific. I have not had the opportunity of consulting the paper referred to as originally published, but have seen only abstracts of the same. On examining several works on Botany, general, as well as specially referring to Mexico, I was unable to find a plant of the name given by Podwissotzki. A plant having a strong somewhat lemon-like odor is Cedronella mexicana, *Bentham*, which has been admitted into the Mexican Pharmacopœia under the name of *toronjil*, it being used as an antispasmodic; its volatile oil is similarly employed and also as a perfume. It seems likely that Podwissotzki's researches have reference to this plant (which belongs to the natural order of Labiatæ) or to Aloysia citriodora.

The Mexican Pharmacopœia has admitted, under the name of *yerba dulce*, two indigenous species of Lippia, L. graveolens, *Kunth*, and L. dulcis, *Treviranus*, which are used in the form of infusion for their

demulcent, pectoral and emmenagogue properties. The first-named species has oval-oblong leaves, which are rounded or somewhat heart-shaped at the base, finely hairy above and white velvety beneath. The leaves of the second species are membranous, oval or deltoid, acute, serrate, prickly, rough above and pubescent beneath. The odor is strong, somewhat resembling wormwood; the taste is refreshing and at first piquant, afterwards mild. Rio de la Loza ("Union Med. de Mex.," i, 1857) found in the plant a sweet principle, volatile, and soluble in water and alcohol, a volatile oil, a stearopten resembling camphor, etc

It will be observed that in properties and constituents these plants resemble some of the labiatæ, and other Mexican species of the same genus are probably equally aromatic or more so, and are employed in the place of some of our labiate plants. Thus the common name of *salvia poblano* or *salvia real de Puebla* is applied to Lippia callicarpiæfolia, *Kunth*, which species is regarded as the Mexican substitute of the sage of our pharmacies. Another species, Lippia origanoides, *Kunth*, which is known in Mexico as *origano*, and by the Mexican Pharmacopœia is stated to be a substitute for our common origanum.

The verbenas proper are well represented in our gardens as ornamental plants by a large number of varieties and hybrids produced from about half a dozen species, of which Verbena Aubletia, *Lin.*, is indigenous to North America, from Virginia and Illinois southward, and westward to the Rocky Mountains, and is reputed to possess acrid and mucilaginous properties. The other cultivated species were introduced from Brazil and other parts of South America about 50 or 60 years ago, and in part at least are employed in their native countries as diaphoretics and emmenagogues. V. erinoides, *Lamarck*, V. teucrifolia, *Martius*, V. multifida, *Ruiz*, V. chamædrifolia, *Jussieu*, V. teucrioides, *Hooker*, V. phlogiflora, *Cham.*, and others contribute to these ornamental plants, which are valued for their bright or delicate colors.

V. officinalis, *Lin.*, is a European weed, somewhat naturalized in this country, with pinnatifid leaves, and small reddish or purplish flowers, inodorous, bitterish and somewhat astringent. It possesses mild stimulant, tonic and astringent properties, and is still recognized by the French Codex as *verveine officinale;* also by the Pharmacopœia of Mexico, though in the latter country in place of it V. caroliniana, *Lin.*, is generally employed, which possesses similar properties, and is common in dry soils in our Southern States. It grows to the height

of about 20 inches, has obovate, crenately dentate sessile leaves, and rather large rose-colored flowers in loose terminal spikes. The inodorous Verbena ciliata, *Bentham*, is used in Mexico in the place of hyssop.

Among the North American species the handsome blue flowering Verb. bracteosa, *Michaux*, has the reputation of being useful in scrofulous complaints; the homely blue vervain, V. hastata, *Lin.*, has been employed in fevers, and in large doses acts as an emetic; and the coarse-looking white vervain, V. urticifolia, *Lin.*, is reputed to be useful in various complaints, and is employed as a topical application in poisoning by Rhus Toxicodendron.

In some of the West Indian islands and in Central America Stachytarpha (Verbena, *Lin.*) jamaicensis, *Vahl*, is known as verbena, from which genus it differs mainly by its four-toothed calyx, by two barren and two fertile stamens, and by the two-parted fruit. The plant is somewhat woody, 2 or 3 feet high, has elliptic or ovate sharply serrate leaves, and produces slender spikes of small blue flowers sunk in furrows of the thickened rhachis. Like other allied plants, it is popularly used in a variety of diseases, but seems to be most useful as a diaphoretic and tonic. It is likewise used in Brazil, and, with one or two allied species, is known there as *jarbão* and *urgevão*.

The above notes show that the plants of the natural order of Verbenaceæ possess tonic and stimulant properties, and that those growing in tropical or subtropical countries are frequently aromatic, and some of them acrid. Considering the fact that the species of the temperate climates are destitute, or nearly so, of aromatic properties, and contain bitter and astringent principles only to a limited extent, it is not surprising that they are apparently not possessed of any decided medicinal virtues, and that they have received but little attention from the pharmacist and still less from the chemist; but it is likely that many of those growing in warmer climates may open an interesting field for chemical research on the nature of their volatile oils, their bitter or acrid principles, their tannins, and possibly other constituents.

PILOCARPUS IN URTICARIA.—Obstinate urticaria is reported by M. Guineau de Mussy to be cured by ℞ pulv. pilocarpi, ext. guaiaci a a gr. 2, lithii benzoatis gr. 3, m. ft. pil. Two pills, gradually increased to four pills, are administered daily, combined with sulphur baths.—*Pacif. Med. and Surg. Jour.*, April, 1885.

GLEANINGS FROM FOREIGN JOURNALS.

By J. Robert Moechel.

Detection of HNO_3, HNO_2, *and* HNO *in concentrated* H_2SO_4.—A very convenient and delicate test for the above is ferrous sulphate, precipitated by means of alcohol from the watery solution, which when dried is a whitish coarse powder. Put into a test tube, about 1 cm. in width, 3 cc. of the colorless sulphuric acid, add a pinch of the white ferrous sulphate, and shake; the salt floats in small particles, the acid remaining colorless and the salt white, even on heating. In the presence of slight traces of nitrogen acids the acid assumes a reddish violet color, or the white salt particles take immediately a violet-gray color. Hager states that this test is more delicate than the test given by the German Pharmacopœia, and easier to execute.—*Ph. Centralhalle,* 1885, p. 141.

A new reagent for the detection of albumen is given by Prof. Dr. Axenfeld, who observed that auric chloride ($AuCl_3$) gives very characteristic colorations with albuminoids. Add to a solution of albuminoids a little formic acid and $AuCl_3$ (1:1000) and warm; gas bubbles arise, and the solution assumes a rose color; a further addition of $AuCl_3$ gives a purple, bluish or deep blue color, and a large amount causes a blue flocculent precipitate, the liquid becoming clear like water.—*Central Bl. Med. Wiss.; Chem. Ztg.,* 1885, No. 32.

Carvol.—Freshly made oil of caraway does not contain a phenol, giving, therefore, no coloration with ferric chloride; but the oil in the course of time, say one year, gives that coloration.

To deprive carbon bisulphide and kerosin of the disagreeable odor, mixing with oil or fat and careful redistilling is recommended.

Cornutine and Ergotinine.—According to M. Tanret, Kobert's cornutine ("Am. Jour. Phar.," 1885, p. 170) is more or less changed ergotinine.—*Jour. Phar. Chim.,* 1885, p. 6.

Remedy for Tapeworm.—De Vrij recommends the following, which is stated to yield a uniformly successful preparation: Dry pomegranate root bark is macerated and exhausted with cold water, and the liquid is evaporated to a powdery extract, which should be kept in a well-corked bottle. The dose of this is 4 Gm., divided in 8 packages, and taken, on an empty stomach, every quarter of an hour. To the last package 0·10 Gm. (1½ gr.) of calomel is added. Soon the living tænia makes its appearance, and should be seized by the patient or an assistant to extract it entirely.—*Jour. de Phar. d'Anvers,* 1885, p. 59.

Antiseptic.—G. Sternberg recommends a solution of 2 Gm. of corrosive sublimate and 2 Gm. of potassium permanganate in 1 liter of water. The advantages are: 1. The poisonous liquid is colored. 2. The antiseptic effect of the sublimate is combined with the deodorizing action of the permanganate.—*Monatsh. f. Dermat.; Ph. Centralhalle,* 1885, No. 10.

Iodoform Pencils.—Triturate cacao butter with a warmed pestle, and mix well with iodoform until a somewhat soft mass is obtained, which is put into a tin syringe, and by slow pressing formed into sticks of convenient length.—*Phar. Ztg.,* 1885, No. 29.

Gelatin Bottle-Capping.—Soak 7 lbs. of Russian gelatin in a mixture of 10 oz. of glycerin and 60 oz. of water, until it is thoroughly softened; then heat in a water-bath, to liquify, and add a few drops of a watery solution of any aniline color. The capping sets quickly, and should be used while hot.

Marasquino di Zara.—Alcohol (90 per cent.) 2 liters, distilled water 1¾ liters, triple orange-flower water 80 Gm., vanilla tincture 20 Gm., bitter almond water (concentrated) 30 Gm., aromatic tincture 10 Gm., simple syrup 900 Gm. The flavor depends upon the quality of the ingredients used.

Enamel Labels.—Mix copal or dammar varnish with sufficient oxide of zinc, and paint therewith.—*Ph. Ztg.*

Turtle Oil *from the Seychelles* is obtained from the greenback turtle, Chelonia mydas, by boiling the fat. Mr. J. H. Brooks informed Mr. E. M. Holmes that for some twenty years he has used turtle oil with the most beneficial results in all cases where cod liver oil was indicated, and that it is administered in the same doses as the latter. As much as ten gallons of oil are sometimes obtained from a single turtle, and it could be supplied in very large quantities if a demand should arise for it. Its color and non-drying properties render it admirably adapted for pomades, for which an animal oil is generally considered to be preferable to a vegetable one.

Turtle Oil from Jamaica is used in a similar manner and is prepared from the flesh of the back of the trunk turtle, probably Chelonia Caouana. A sample of oil received by Mr. Holmes was not quite as palatable as the preceding. Both oils are yellowish and at the ordinary temperature form a thick, finely granular fluid, resembling in consistence partly congealed olive oil.—*Phar. Jour. and Trans.,* Jan. 17, 1885, p. 573.

KERATIN-COATED PILLS.

By Dr Unna.

Dr. Unna, of Hamburg, has discovered a coating for pills, which is likely to prove even more useful than it is ingenious. The task which he set himself was to find a coating which would resist the solvent action of the gastric juice, but would dissolve in the small intestine. This he has succeeded in doing by the use of keratin, a substance extracted from the shavings of ox or buffalo horn. The shavings are first digested by artificial gastric juice (pepsin solution with 1 per cent. hydrochloric acid), and are then macerated for weeks in ammonia. When the ammonia is driven off, a gummy solution of keratin is left, from which, by drying, keratin is obtained in the form of shining, bright, yellow flakes.

A pill which is to be covered with keratin requires to be prepared in a special manner. The medicine employed is first rubbed well up with cacoa butter or tallow, with the addition of some indifferent powder, if necessary, and pills are made. The pills are then covered with cacoa butter, so as to prevent any of the medicine from being on the surface of the pill. When the pill is hard it receives one, or, better, two or three coatings of solution of keratin. If the substance of which the pill is made renders solution in ammonia inconvenient, a solution in glacial acetic acid may be used. Keratin-coated pills are insoluble in the gastric juice, but dissolve as soon as they enter the small intestine, and have, therefore, a special value in cases in which medicines which have an irritating effect on the mucous membrane of the stomach are to be administered for any length of time; for example, when arsenic, salicylic acid, kreosote, copaiva, cubebs, tartar-emetic, and vermifuge medicines are prescribed.

The method is further useful when medicines are given which are affected by digestion in the stomach, forming insoluble precipitates with pepsin and peptones; for example, tannin, alum, acetate of lead, subnitrate of bismuth, nitrate of silver, bichloride of mercury, etc.; and, further, in the case of medicines which it is desired should enter the intestine in as concentrated a form as possible, and medicines which are given with the view of affecting favorably diseased conditions of the mucous membrane of the stomach without exercising an irritating local action; for example, iron, quinine, arsenic in catarrh of the stomach arising from ammonia.—*British Medical Journal; Jour. Am. Med. Assoc.*, April 4, 1885.

MATERIA MEDICA OF THE NEW MEXICAN PHARMACOPŒIA.

By the Editor.

(Continued from p. 280.)

Ancusa, Anchusa tinctoria, *Lin.;* the root is used for coloring pomades.

Angélica, the root of Angelica Archangelica, *Lin.* Dose, in powder, 5 to 10 gm.; the infusion, 15 gm. to one liter of water.

Angostura verdadera, the bark of Galipea officinalis, *Hancock, etc.* Dose of powder, 2 to 4 gm.; of extract, 0·5 to 1·0 gm.; little employed.

Anís comun and Anís estrellado are Anise and Star-anise.

Anisillo cimarron, Schkuhria abrotanoides, *Roth,* a Mexican composite, is anti-spasmodic.

Anona reticulata and A. glabra, *Lin.,* Mexican custard apple. The fruit is edible; the decoction of the bark, leaves and green fruit is reputed to be astringent and used in diarrhœas; the infusion of the leaves is anti-spasmodic; the powder of the seed is employed as an insecticide and is dangerous.

Añil, Indigo, is little used medicinally.

Apio, Parsley, is aperitive and used in infusion of 15 to 30 gm. to the liter.

Árbol de la cera, Myrica jalapensis, *Kunth,* nat. ord. Myricaceæ, is indigenous to the sierra of Huauchinango. The wax obtained from the fruit by boiling with water is green or yellow, according to the method of extraction, more brittle and unctuous than bees' wax, has a feeble odor, a slightly bitter taste and a density nearly equal to that of water and melts at 43°; but on exposure the fusing point rises to 47·5°. It is wholly soluble in boiling ether, insoluble in water, sparingly soluble in cold alcohol and dissolves in 20 parts of boiling alcohol, depositing the greater part on cooling; alkalies saponify it readily. It has probably the same composition as myrtle wax from Myrica cerifera. It is given internally in powder against diarrhœa and jaundice, and is used for making candles, for adulterating bees' wax and as a substitute for the latter in pharmaceutical preparations. The bark of the root is acrid and astringent, and in larger doses emetic.

Árbol de los manitas, Cheirostemon platanoides, *Humb. et Bonpl.,*

nat. ord. Bombaceæ, indigenous to Mexico. The flowers are used internally in epilepsy, and as an emollient in ophthalmia.

Árbol del Perú, Schinus Molle, *Lin.*, nat. ord. Terebinthaceæ, grows in various parts of Mexico. The leaves, masticated, serve as a remedy for loose teeth and atonic ulcers of the mouth. The fruit, known as *Pimienta de América*, is stomachic, stimulant and diuretic; it contains a notable quantity of sugar and may be used for the production of alcohol and vinegar. The bark has astringent and balsamic properties. The gum-resin was examined by Manuel C. Jimenex, of Mexico; it forms milk-white tears, varying in size and becoming gradually reddish yellow, softens on mastication, has a bitter and sharp taste with an aftertaste resembling that of cubeb, and a disagreeable odor, becomes soft at 35° and melts at 40° giving off white fumes and an odor like frankincense. Its powder is dingy white and is easily emulsionized with water. It is composed of 40 gum, 60 resin and a small quantity of volatile oil. Two or three drops of the concentrated emulsion are used for the removal of spots on the cornea.

Aristoloquia larga and A. redonda, the rhizomes of the European Aristolochia longa and A. rotunda, *Lin.*, are rarely employed as tonics and stimulants.

Arnica montana, *Lin.* The root, leaves and flowers are employed; however, Heterotheca inuloides, *Cassini*, is frequently substituted for the former. The ray florets are pistillate, the receptacle flat and alveolate, the involucral scales imbricate and linear, the akenes of the ray oblong and smooth, those of the disk cuneiform and downy, the lower leaves petiolate oval and dentate, and the upper ones sessile, lanceolate and entire. The chemical constituents and the therapeutic action of this plant have not been investigated.

Aro, Richardia æthiopica, *Kunth*, nat. ord. Araceæ. The plant is very acrid in the fresh state, the juice caustic, the leaves and root vesicating.

Aroma, Acacia Farnesiana, *Willd.*, nat. ord. Leguminosæ; indigenous to Yucatan. The fruit is astringent and yields an extract known as *jugo de acacia* and having the same properties as catechu. The flowers are very fragrant, have anti-spasmodic properties and are much used in perfumery under the name of *casia* or *cassie*.

Arrayan, Myrtus Arrayan, *Kunth;* indigenous to Mexico. The

leaves contain a volatile oil and are used as a perfume; they are astringent and, like the bark, are used for tanning.

Arrowroot (the fecula of different plants), Arroż (rice), Artemisia vulgar (mugwort), Asafetida, Asfalto (asphaltum), Azafran (saffron), Azafrancillo (safflower), Azúcar de caña (cane sugar) are enumerated.

Artemisia del país, Ambrosia artemisiæfolia, *Lin.*, the hog-weed or rag-weed, common also in the United States, is used as a stimulant and emmenagogue, and is reputed to be febrifuge and anthelmintic. Dose, in powder, 2 gm.; of the extract, 0·5 to 1·0 gm.

Atlanchana, Cuphea lanceolata, *Kunth*, nat. ord. Lythraceæ; indigenous to Mexico. The stem is herbaceous, striate, pubescent and viscous; the leaves are opposite, short-stalked, lanceolate and somewhat downy. In Puebla the plant is used by midwives as a corroborant after childbirth. The bruised fresh herb or the tincture of the dry plant is employed, after baths, as an embrocation of the back and hips. The drug is considered to be mildly astringent and anti-dysenteric.

Azafrancillo de Mexico, Escobedia scabrifolia, *Humboldt*, nat. ord. Scrophulariaceæ, grows in the State of Guerrero. According to Dr. Altamirano (*La Naturaleza*, III, 390), the root contains the crystalline principle *escobedin* and the resinous coloring matter *azafranin*, the latter producing with sulphuric acid a blue color, changing to violet. It is used for coloring.

Bálsamo de copaiba, Copaiba. Brazilian and Maracaibo copaiba are used.

Bálsamo de liquidámbar, Sweet gum, from Liquidambar styraciflua, *Lin.*, growing in the State of Vera Cruz and other parts of Mexico. The crude balsam has the consistence of turpentine, is of a gray color mixed with darker pieces and with white tears, has a strong, not unpleasant odor and a bitter warm and acrid taste, and contains fragments of bark and other impurities. It is purified by warming and straining and is then more or less transparent, whitish gray or yellowish and becomes thicker and darker on keeping. In regard to its composition, the older investigations by Bonastre, Hanbury and Creecy are mentioned, but not the more recent ones by Harrison and Flückiger. The balsam is sometimes adulterated with turpentine, and an inferior, dark colored and opaque balsam is prepared by boiling the branches with water. It is used as a balsamic stimulant in doses of 0·5 to 2·0 gm.

Bálsamo negro, Balsam of Peru. It is stated that Myrospermum Pereiræ, *Royle*, grows in Pánuco, Huajicori, Cuautla de Morelos and in other warm sections of the Republic as well as in Central America, and that the fruit and bark of the indigenous tree are also employed. The fruit, which we have seen in 1876 and of which we have recently received specimens from Prof. Alfonso Herrera, resembles that of Toluifera Balsamum, *Lin.*, as figured by Bentley and Trimen, and differs in shape from that named above; of the latter we have specimens from the late Prof. Carson, which he received from Dr. Dorat, and these agree with Bentley and Trimen's figure of the same species. It is known that Prof. Baillon considers these plants as one variable species. The tree does not appear to be used in Mexico for the production of balsam.

Bálsamo de Tolú (Tolu balsam), Bardana (Burdock), Bedelio (bdellium), Beleño blanco and B. negro (hyoscyamus), Belladona (belladonna), Benjuí (benzoin), Bistorta (bistort), Bol de Armenia (Armenian bole), Brusco (butcher's broom), Buchu, and Buglosa (Anchusa officinalis) are enumerated among the drugs.

COMMERCIAL TANNIN.[1]

By T Maben.

It has frequently been the subject of remark that the tannin of commerce varies considerably in quality, and I have recently examined a number of samples with the object of ascertaining within what limits the variation may be said to extend. Of those who have already drawn attention to the question may be cited Mr. H. R. Proctor, who states that "the tannin met with in commerce contains only 80 to 90 per cent. of really pure tannin;[2] Mr. A. H. Allen, who writes in corroboration of this, that some of the samples he examined contained "30 to 40 per cent. of inert matter as indicated by the lead process;"[3] and Sutton, who says that "commercial tannin often contains 20 per cent. of impurities."[4]

My aim in taking up the subject was mainly to determine, if possible,

[1] Read at an Evening Meeting of the "North British Branch of the Pharmaceutical Society," April 8, 1885.

[2] "Pharm. Journal, [3], vol. vii, p. 1020.

[3] *Ibid*, p. 1057.

[4] "Volumetric Analysis," 4th edition, p. 279.

the precentage of tannic acid in the tannins, and with that view I procured nine samples from different sources. The samples are those of London, Edinburgh, and German manufacturers in almost equal proportions, and may therefore be taken to be fairly representative. I may remark in passing that a number of so-called makers do not in reality manufacture or extract the tannin, but simply confine themselves to the *purification* of the German product.

It may be of advantage, before referring to their composition, to note the physical characteristics of the samples. In general appearance they vary considerably, some being crystalline or scaly, Nos. 1 and 5 especially so, while others are almost destitute of scales. They are for the most part of a light yellow or pale straw color, one only, No. 1, being of a perceptibly darker shade. The variation in weight is very remarkable, some of the samples being extremely light while others are comparatively heavy. The specific gravity of the samples was not taken, but their relative weights were roughly determined; from these it will be seen that as a rule the weight bears a striking relation to the percentage of tannic acid, viz., the lighter the tannin the higher the proportion of tannic acid content.

The solubility of tannin is variously stated, the range being from 1 in 0·8 of water to 1 in 6. I have not attempted more than an approximate determination of the solubility of the different samples, so that the figures given must not be assumed to be definite. So far as I have gone, the solubility seems to bear no relation to the percentage of tannic acid.

It is frequently of practical value to know the time required for a given quantity to dissolve, and with the view of ascertaining this, 10 grains of each sample were shaken up with one ounce of distilled water at 60° F. No. 1 dissolved in half a minute, 5, 6, and 8 in two minutes, 2 and 9 in three minutes, while 3, 4, and 7 were only partially dissolved at the expiration of fifteen minutes. The residue in 3 and 4 dissolved at once on the solutions being heated to 80° F., while that in No. 7 still remained undissolved. The aqueous solutions presented points of contrast that are interesting. Nos. 2, 5, 6, and 8 were perfectly clear, 3 and 4 were slightly muddy, 1 and 9 still more so, and 7 most of all. On heating the muddy solutions to 80° F., the opacity almost entirely disappeared from 3 and 4, but not from 1, 7 and 9. The insoluble matter in No. 7 was of a resinous nature; the proportion being very small it was not estimated.

All the samples were soluble in rectified spirit. No. 2 disappeared almost instantaneously, 1, 5, 6, and 7 very rapidly, and 3, 4, 8, and 9 somewhat slowly. When diluted with an equal bulk of water all the solutions remained perfectly clear.

The samples were also soluble in glycerin. Employing the proportions for glycerinum acidi tannici, at a temperature of 60° F., it was found that No. 1 dissolved in about three hours, and No. 5 in four hours. All the others were more or less undissolved at four hours, but when placed in a bath of hot water they dissolved in a very few minutes.

Tannic Acid.—In coming to the consideration of the composition of the samples, I may refer to the uncertainty of our chemical knowledge of the tannins in general, and of the gallotannic acids, as commonly met with, in particular. It would be out of place for me to attempt to summarize the different opinions that prevail regarding gall tannin, but it does not seem as yet to have been determined whether it is or is not a glucoside, and if a glucoside, whether of gallic or digallic acid.

The researches of Paul and Kingzett[1] led them to the conclusion that the gallotannic acid of commerce was not a glucoside, and, further, that "the supposition that tannin, as it exists in gall nuts is a glucoside is rendered doubtful, and the sugar met with in some samples of tannic acid is more probably referable to an impurity, as Rochleder and Kawalier assumed. Schiff leans to the opinion that the tannin in gall nuts is a glucoside, but he states that the gallotannic acid met with in commerce is not a glucoside, but digallic acid."

This uncertainty, coupled with the extreme difficulty of procuring pure gallotannic acid, has always been a barrier in the way of analytical, and especially gravimetric methods for its estimation. A large number of methods have been proposed, but most of these are, according to competent authorities, more or less faulty. Proctor, in the paper already quoted, gives a decided preference to Löwenthal's volumetric method, and Dragendorff,[2] after summarizing the more important processes and indicating precisely the strong and weak points of each, also seems to prefer the permanganate method. My own experience of the gravimetric methods has been that I found a difficulty in obtaining concordant results, and these, moreover, were generally too high, which is doubtless to be accounted for by the varying composition of the precipitates, and the liability of the tannin and its salts to undergo decom-

[1] "Journ. Chem. Soc.," vol. xxxiii, p. 217.
[2] "Plant Analysis," pp. 41–46.

position during the process of manipulation. These disadvantages are, if not entirely obviated, at all events lessened in the method by Löwenthal, and as this, in the present state of our knowledge, may be regarded as the most satisfactory, I have employed it in the estimation of the tannic acid.

The working details of the process are given very fully by Sutton, and for these it is only necessary for me to refer to his standard work. That there are difficulties in the actual carrying out of the process is undeniable, the most formidable of these being the uncertainty of the end-reaction and the doubt as to the exact amount of correction required for the gelatin. Sutton directs the permanganate to be delivered in very slowly with constant stirring "until a faint rose color appears round the edges of the liquid," while Dragendorff says the solution is to be run in "till the blue color changes to green." It will be found in actual practice that the rose color is considerably distant from the green, and as everything depends on knowing exactly when to stop it must be admitted that in this respect the process is not yet perfect. I found that it was necessary, in order to get good comparative results, to run in permanganate solution till the color, a faint yellow, was as nearly as possible identical with that of a standard solution kept side by side with the liquid being titrated. Authorities also differ as to the correction required for the gelatin. Proctor, quoted by Sutton, says that "probably the nearest approach to the truth may be obtained by deducting half the correction for gelatin from the oxidizable matter other than tannin," whereas, according to Dragendorff, "the addition of gelatin as described by Löwenthal introduces only a slight source of error which may be generally neglected." As to the latter statement, it is obvious that if only comparative results are required, the error may be neglected, provided always that a carefully standardized gelatin solution be employed, but if even approximately correct figures are wanted, it is absolutely necessary that the correction for gelatin be made. I am also decidedly of opinion that Proctor is within the mark when he deducts only half the gelatin correction, and prefer rather to go to the other extreme by deducting the whole. This I have done in these estimations, and consequently it is just possible that my results as regards the percentage of tannic acid may be rather high.

Having ascertained the quantity of permanganate required for oxidation, the calculation of the results is readily accomplished. For this purpose I have used the coefficients of Neubauer and Oser, as given

by Sutton, according to whom, one gram of pure gallotannic acid requires for oxidation 0·759 gram $K_2Mn_2O_8$. It is somewhat unfortunate that authorities are not agreed as to the value to be assigned to the permanganate. Dragendorff, on Gunther's authority states that "16 parts of oxygen from the permanganate oxidize 32·5 parts of gallotannic acid." Even if we assumed that the $K_2Mn_2O_8$ parted with all its oxygen for this purpose we would still find that 0·759 gram only represents 0·62 gram acid, in other words, that Gunther's value is, at the very utmost, only five-eighths that of Neubauer's. Too much stress need not be laid on these differences, however, as the method of procedure adopted may sufficiently account for the discrepancies, and admitting that the actual value of the permanganate has not yet been ascertained, there can nevertheless be no doubt that as a comparative test for the same class of tannins Löwenthal's process is unexceptionable.

Organic Matter other than Tannic Acid.—The percentage of oxidizable matter other than tannic acid can of course only be taken by difference, a method of which the disadvantages are peculiarly evident in the case of tannin. The application of Mr. Young's cyanide of potassium test,[1] assuming it to be correct, showed that all the samples contained traces of gallic acid, the coloration being much more distinct in some than in others. When this reagent is added to a solution of tannin, there is thrown down a precipitate which is usually at once redissolved. The bulk of this precipitate seems to be in direct ratio to the purity of the tannin, as Nos. 1, 2, and 5 gave very heavy precipitates, whereas those in 3 and 4 were scarcely noticeable. This precipitate was immediately redissolved in every case with exception of No. 8, but after a lapse of twenty-four hours it was found that all the solutions contained a more or less thick layer of another precipitate, which consisted of an amorphous white powder. This was smallest in No. 7, and gradually increased in the following order: 2, 9, 5, 4, 3, 1, 6 and 8. No attempt was made to estimate these precipitates, as it was found that an insoluble precipitate can, under certain conditions, at once be produced by this same reagent, so that it is possible that we have here another method for the gravimetric estimation of tannic acid, as well as for the separation of that acid from gallic acid; but further experiments are required to elucidate these points.

[1] "Chemical News," vol. xlviii, p. 31.

One feature in the table will strike every observer as being quite peculiar, if not altogether anomalous. If we take, for example, No. 8, we find the oxidizable matter other than tannin to be 38·3 per cent., and this consumed 0·0555 gram $K_2Mn_2O_8$, whereas in the case of No. 1 the oxidizable matter is 6·2 per cent., yet it consumed 0·0586 gram $K_2Mn_2O_8$. I fear I am unable to suggest a reasonable explanation for these apparent discrepancies; but it might be possible to account for them by supposing that we were estimating oak-bark tannin or mixtures of oak-bark tannin and gall tannin, in place of pure gall tannin. The coefficients assigned by Neubauer and Oser to oak-bark tannin are equivalent to 0·759 $K_2Mn_2O_8$ to 1½ grams tannin, so that if we were prepared to assume that this tannin has been made use of, we would get in the case of No. 3, for example, 81 in place of 54, and so on. This theory is, however, opposed by two considerations. In the first place, Gunther allows very much the same value to oak-bark tannin as to gall tannin, the figures being 32 and 32·5 respectively to 16 of oxygen from the permanganate; and in the second place, a sample of gall tannin, prepared by another than the B. P. process, and not included in the table because not strictly a commercial tannin, showed much the same anomalous result, there being 66 per cent. of tannin and 26 per cent. of oxidizable matter other than tannin, the latter consuming only 0·055 gram $K_2Mn_2O_8$.

Moisture.—It was found to be impossible to take the moisture by drying in the usual way, as in no case could constant weighings be obtained, and recourse was therefore had to drying *in vacuo* over sulphuric acid. According to Strecker,[1] tannic acid heated to 160° C. becomes darker in color from incipient decomposition. Several of the samples began to change color very rapidly. No. 7, for example, being perceptibly darker after being kept for an hour at about 110° C., while No. 2 was apparently unaltered at the expiry of two and a half hours, all the others occupying positions between these two.

Ash.—Authorities, generally, are agreed that tannin should on incineration be free from ash, and, practically speaking, it was found that all the samples save one answered to this requirement, the exception, No. 7, giving as much as 0·4 per cent. This relatively large proportion of mineral matter doubtless accounts for the excess in weight of this sample as compared with those in which the tannic acid content is very similar.

[1] "Gmelin," vol. xv, p. 458.

	$K_2Mn_2O_8$ required to oxidize 1 gram tannin.			Tannic acid Per cent.	Oxidizable matter other than tannin (by difference.)	Moisture.	Relative weight, lightest being 10.	One part tannin soluble in parts water at 60° F.
	Before precipitation.	After precipitation.	Difference.					
1.	0·733	0·0586	0·6744	88·8	6·2	5·0	12	1
2.	0·679	0·0192	0·6598	86·9	5·1	8·0	10	1
3.	0·4737	0·0601	0·4136	54·4	40·6	5·0	25	1
4.	0·5015	0·0694	0·4321	56·9	36·1	7·0	28	1·5
5.	0·6173	0·0108	0·6065	79·9	14·1	6·0	10	2
6.	0·6172	0·0308	0·5864	77·2	15·8	7·0	12	1
7.	0·6913	0·0663	0·6250	82·3	14·3	3·0	24	3
8.	0·5091	0·0555	0·4536	59·7	37·3	3·0	41	1
9.	0·5756	0·0385	0·5371	70·7	25·3	4·0	30	1·5

—*Pharm. Jour. and Trans.*, p. 850, April 18, 1885.

SPURIOUS CUBEBS.

By Edward D. Gravill.

Some weeks ago, when the false cubebs mentioned by Mr. Holmes in the Journal of May 9th were offered on the London market, a sample of the same was handed to me by Mr. Stacey, with a request that I should examine it and report to him the result. Mr. Stacey, at the time, expressed no doubt that the sample was a clever substitute for the true drug, and the result of a comparative microscopical and chemical examination was to confirm his opinion. Since that time I have had brought under my notice a powder, which, from the explanation given by Mr. Holmes, is similar to that examined by him. It was said to have produced sickness, and diarrhœa, together with considerable prostration and internal irritation, an effect differing entirely from that of the true powder, which the patient had before and afterwards taken. Having fresh in my memory the false berry above referred to, my impression was that some of these might have found their way into the genuine article, an idea which was partly substantiated by the distinctly mace-like odor of the powder.

No difficulty was experienced in distinguishing between the true and false powder, when unmixed, by their microscopical characters; but, in this case, I had evidently to deal with a mixture in which those characters were altogether unreliable.

My experience with the chemical tests, applied, in my case, to a

tincture, did not materially differ from those descibed by Mr. Holmes, but I would like to make the following addition. I found that a tincture of the true drug treated with an excess of strong sulphuric acid developed a decided deep violet coloration, and then when poured into water formed an opalescent deep blue solution. The false tincture, on the other hand, when treated in a similar manner, gave with the sulphuric acid a reddish brown color, which, on pouring into water, changed to a dirty yellow opalescence, without a shade of blue. This suggested to me that from the distinct colors obtained it might be possible to form some estimate of the extent of the substitution, and with this end in view the following experiments were performed:

A tincture of the true, false and suspected powders was separately made with rectified spirit, each being of the same strength as the official tincture.

One cc. of each was then treated with 10 cc. of strong sulphuric acid (sp. gr. 1·843), when the following colors were developed:

True.	False.	Suspected sample.
Deep violet.	Deep red brown.	Dull violet.

These acid mixtures were then poured into separate beakers, each containing four fluid ounces of distilled water, standing on a white tile, with the result that the following colors were observed:

True.	False.	Suspected sample.
Opalescent.	Opalescent.	Opalescent.
Deep blue.	Dirty yellow.	A very indistinct blue with a decided tinge of green.

The above colors were very distinct, and showed in the suspected sample undoubted presence of the two former colors.

The tinctures of the true and false drugs were next adjusted until the color obtained under the same treatment represented that of the suspected mixture, when the relative proportions required were 0·74 cc. of the true and 0·26 cc. of the false tinctures, which would represent an adulteration to the extent of 26 per cent.

I do not, of course, recommend the above as an accurate colorimetric method for estimating the adulteration, but, from subsequent experiments, have come to the conclusion that in the absence of reliable microscopical evidence it forms an easy means, not only of detecting the adulteration, but of forming an approximate idea as to the extent of this obnoxious, and evidently irritable and dangerous substitution for a most useful drug.—*Phar. Jour. and Trans.*, June 6, 1885.

THE SEAT OF THE ACTIVE PRINCIPLE IN VESICATING INSECTS.[1]

By H. Beauregard.

The author has made an attempt to solve the hitherto incompletely elucidated question as to the exact seat of the cantharidin in the bodies of vesicating insects, using in his investigations the ordinary European *Cantharis vesicatoria*, of which he was favored with a good supply. The result of the researches upon this point made by Berthoud, Ferrer, Fumouze and Lissonde, using chemical methods, may be summed up in the proposition that "the soft parts are much more active than the hard parts (elytra, legs and head)." Courbon, experimenting physiologically upon *Epicauta adspersa*, denied that the hard parts exercised any epipastic action, and Leidy, speaking of *Epicauta vittata*, went further, and said of this species that "the vesicating principle resides in the blood and in a fatty matter peculiar to certain glands accessory to the generative organs and in the eggs" (see "Am. Jour. Phar., 1860, p. 157.

The author in his experiments estimated the vesicating property of the substance under examination, by applying to his arm either a moistened powder of the particular parts of the insect, or the mixture of oil and crystals obtained by macerating them twelve hours in acetic ether, expressing, filtering and evaporating. In this way he ascertained that in the case of *Cantharis vesicatoria* the blood is vesicant in a rather high degree, whilst the hard parts, free from blood, are absolutely inactive. As to the soft parts, he found that the muscles, respiratory and digestive organs, fat, and malpighian tubes are quite devoid of epispastic power, which resides solely in the genital apparatus.

In the male the testicles and the deferent canals are inactive, but an energetic vesicant property was found to reside especially in the pair of seminal vesicules situated in much elongated cylindrical tubes. The applicatation to the forearm of a small portion of one of these vesicules determined the formation of a voluminous blister, with a painful tumefaction at the periphery. Sometimes a blister was obtained with the part of the deferent canals nearest to these tubes, but this was attributed to sperm contained in the canals, for in the majority of cases these were found to be completely inactive.

[1] From a paper read before the French Association for the Advancement of Science. ("Bulletin Commercial," xii, 437.)

In the female, all the parts of the genital apparatus and the eggs are epipastic. The eggs, after being deposited, were found to have a very energetic vesicant action, and this induced the author to see if this property disappeared at any period during the evolution of the insect to reappear subsequently. He found the larva as it first issues from egg is equally active, five and twenty of them reduced to a pulp and applied to the forearm producing a small blister. Lastly, the very young cantharides, measuring 8 to 10 millimetres long, which had not yet coupled, were found to be equally vesicant. These various results invalidate the conclusions of Nentwich ("Pharm. Journ." [3], i, 158; "Am. Jour. Phar.," 1870, p. 528), who asserted that the epispastic power is not developed until after the coupling of the insects, and that young or medium-sized insects do not determine the formation of blisters on the skin.

Experimenting as to the genera in which the vesicating property occurs, the author found it in species of *Meloe, Cerocoma, Mylabris, Coryna, Œnas, Lydus, Alosymus, Cabalia, Lagorina, Cantharis, Lytta, Epicauta,* and *Sitaris,* many of which are already recognized as vesicants, but some have not yet been studied. He also found it present in *Henous confertus,* belonging to a genus that, to his knowledge, had not been properly tested. The genus *Zonitis* has been ranged by Leclerc among non-vesicant insects, but Beguin, on the contrary, has stated that he has found two species (*Z. præusta* and *Z. fulvipennis*) active. The author confirms the latter observer, since he obtained a large blister, after eight hours' application of *Z. mutica* and *Z. bilineata.* The genus *Nemognatha,* which has also been reported to be inactive by Leclerc, was found to have active representatives in *N. chrysomelina* and *N. lutea.* The author concludes from his experiments that, omitting the group of *Horiides,* all the insects belonging to the tribe Cantharides are vesicants.—*Phar. Jour. and Trans.,* April 25, 1835, p. 873.

Antiseptic Silk.—Freeman uses Chinese twist which has been rendered aseptic by boiling for ten minutes in a two per cent. solution of chromic acid, and then soaking for twelve hours in a one per cent. solution of the same. He states that the sutures may be left *in situ* for three weeks without the occurrence of either suppuration or softening of the silk. Silk thus prepared is especially useful in operations about the genital organs in women as well as in laparotomy.—*N. Y. Medical Journal.*

GLEANINGS IN MATERIA MEDICA.

By the Editor.

Dicinchonine, $C_{38}H_{44}N_4O_2$ according to O. Hesse, exists in the bark of Cinchona rosulenta and C. succirubra, chiefly in the branch bark of red cinchona. It may be obtained by fractional precipitation with sulphocyanide from the mixed amorphous alkaloids before melting, but not from commercial chinoidine, the dark colored compounds preventing crystallization. The bark of C. rosulenta is the best material, containing, besides cinchonidine, homocinchonidine, cinchonine and traces of quinamine and conquinamine, about 0·2 to 0·3 per cent. of dicinchonine. The neutral sulphate solution is treated with Rochelle salt for separating the first two alkaloids, then with excess of ammonia and shaken with small quantities of ether, whereby most of the cinchonine is left behind; the ether solution is agitated with dilute acetic acid, and this liquid neutralized and precipitated in fractions by potassium sulphocyanide, the first and third fractions being mixed with the other bases. The dicinchonine sulphocyanide is treated with caustic soda solution, the mixture extracted with ether the ether solution washed with water and evaporated, the residue dissolved in alcohol, neutralized with hydrochloric acid and evaporated when dicinchonine hydrochlorate crystallizes. The free base is easily soluble in ether, acetone, alcohol, chloroform and in benzol, less freely soluble in water and petroleum benzin, insoluble in caustic soda; the alcohol solution has an alkaline reaction and a bitter taste and is dextrorotatory; chlorine and ammonia do not produce a green color. The *hydrochlorate* crystallizes in anhydrous four-sided prisms which are often nearly cubical, and readily dissolve in water and alcohol. The *chloroplatinate* forms orange yellow flocks, readily soluble in hydrochloric acid. The *hydriodate* is in stout crystals, soluble in water, but insoluble in concentrated solution of sodium chloride or potassium iodide. The *sulphocyanide* is amorphous and separates from hot water as an oily layer. The *oxalate* is obtained in firm crystals on gradually adding an ether solution of oxalic acid to an ether solution of the base; the salt is freely soluble in cold water. On heating the alkaloid for 6 hours with concentrated hydrochloric acid to between 140° and 160° C., it is completely converted into *diapocinchonine*; and the same base is probably contained in the dark colored mass formed by heating

dicinchonine with sulphuric acid to 130° C.—*Ann. d. Chem.*, vol. 227, p. 153–161.

False cubebs have been offered in the London and New York market. In 1861 Gronewegen referred a false cubeb to Piper anisatum, *Humb. et Bonpl.*, and Stillé and Maisch (Nat. Disp., 2d edit., p. 479, 3d edit., p. 522) consider this to be probably the same which Flückiger and Hanbury (Pharmacographia, 2d edit., p. 588) refer to Piper crassipes, *Korthals.* Wm. Kirkby finds the description of the latter to differ from that of the drug under notice, in that the stalk of P. crassipes is one and a half times to twice as long as the berry, and that the taste is very bitter. A fruit seen by Kirkby in Kew Gardens, said to be from Piper sylvestre? *Lam.*, closely resembles this false cubeb, but has a lighter color, a longer terete stalk, an odor reminding one of pepper, and a taste not aromatic. Kirkby's description of cubebs and the false drug, arranged for convenient comparison, is as follows:

Cubebs.	*False Cubebs.*
Spherical, somewhat pointed at the apex, reticulately wrinkled, contracted at the base into a stalk.	Like cubebs, but more strongly wrinkled.
Color brownish gray or blackish.	Color brownish gray to brown, rarely approaching black.
Odor aromatic, spicy and characteristic.	Odor rather pleasant, resembling mace.
Taste pungent, aromatic, slightly bitter.	Taste aromatic, warm, somewhat bitter.
Diameter 3 to 5 mm.	Diameter 4 to 6 mm.
Stalk 5 to 9 mm.	Stalk flattened, 4 to 7 mm.
Pericarp in three layers. Exterior one, beneath the epidermis, an interrupted row of cubic thick-walled cells, in groups of three or four. Middle layer broad, made up of loose undeveloped tissue, containing stellate groups of needle-shaped crystals and large quantities of starch, and interspersed with larger oil cells, the latter colored red-brown with concentrated H_2SO_4; a section kept in glycerin for several weeks shows large groups of prismatic crystals, concentrically arranged. Inner layer consists of about four rows of parenchyma cells, tangentially elongated, and on outer margin of 11 or 12 wood bundles, formed mostly of narrow spiral vessels, with few dotted vessels.	Pericarp in three layers. Exterior one, an interrupted ring of thickened cells, little larger than in cubebs. Middle layer composed of loose parenchyma, containing starch less abundantly than cubebs, and interspersed with oil cells, the latter colored red with H_2SO_4; a section does not yield crystals. Inner layer free from starch, composed of ten rows of tangentially extended thin-walled cells, and on outer margin of 14 or 15 wood bundles, formed of narrow spiral vessels, with few dotted vessels.

In both drugs the testa consists of one row of large encrusted, thick-walled cells, elongated and radially arranged, and containing calcium carbonate. Surrounding the perisperm is a red membrane formed of

rather large cells, and lining this is a thin colorless structure similar to it, but composed of smaller cells.

The perisperm is made up of angular parenchyma containing starch and oil, the oil cells colored red-brown by H_2SO_4; thin sections kept in glycerin for a few weeks, form thin plates of crystals in the perisperm of cubebs, but not in false cubebs.—*Phar. Jour. and Trans.*, Feb. 14, 1885, p. 653.

Asarum europœum. B. Rizza and A. Butlerow give to *asarone* the formula $C_{12}H_{16}O_3$ and state that it melts at 59° C., boils at 296° C., has the spec. grav. 1·165 at 18° C., is inodorous, has a faintly pungent taste, is somewhat soluble in boiling water and crystallizes on cooling in delicate needles and scales. Graeger's *asarit* is merely asarone crystallized in fine needles.—*Ber. D. Ch. Ges.*, 1884, p. 1159.

Poleck communicates (*ibid.* p. 1415) a few of the results thus far obtained by Staats with the same substance. Asarone is very difficult to purify, is phosphorescent, melts at 61° C., has most likely the composition $C_8H_{10}O_2$, yields with nitric acid oxalic acid and a neutral crystalline compound, and in addition to these, with potassium permanganate, carbonic, formic and acetic acids and a non-volatile crystalline acid.

Wood oil from Elæococca cordata, nat. ord. Euphorbiaceæ, has a decided brown color, and a disagreeable odor, is rather more fluid than castor oil, and on exposure dries rapidly. According to R. H. Davies, its spec. grav. at 60°F. is ·94015; it remains liquid at —13·3°C. (8°F.), becomes black with sulphuric acid, solidifies and becomes orange-yellow with nitric acid, and yields with nitrous acid a dark semi-solid mass. 100 grams of the oil require 0·39 gram caustic potash for neutralization, and 21·1 grams for complete saponification. The mixture of fatty acids weighs 94·1 per cent. of the oil, melts at 39°C., and its solution in alcohol readily yields crystals.—*Phar. Jour. and Trans.*, Feb. 7, 1885, p. 636.

E. M. Holmes states that this dark-colored oil is probably made by boiling the kernels previous to expression, the cold-drawn oil being colorless, inodorous and nearly tasteless. The latter, according to Cloëz ("Compt. Rend., 1875, vol. 81, p. 469), has the spec. grav. 0·9362, congeals at —18°C. to a transparent mass, solidifies rapidly when exposed to light in a closed vessel, and is the most drying oil known. It is used in skin diseases, for ulcerated wounds and carbuncles, for varnishing furniture, all kinds of wood work, umbrellas,

paper and paper leather, and for painting and caulking junks.—*Ibid.*, p. 637.

Baillon names the tree Aleurites cordata, and mentions as synonyms Dryandra cordata, *Thunberg*, Dr. Vernicia, *Correa*, and Elæococca Vernicia, *Sprengel.*

White birch tar, Oleum Rusci.—P. Macewan has examined three commercial samples of this tar, the odor of betulin being present in each, but harsher in the German and Dutch oils than in the Russian, which is pleasant. The saponifiable substances were ascertained by shaking the ether solution with excess of potash solution, acidifying the alkaline liquid and treating with ether.

	Russian.	German.	Dutch.
Physical properties.....	Thick brown-black, sp. gr. ·955.	Limpid, brown, sp. gr. ·967.	Limpid, translucent, red brown, sp. gr., ·941.
Cold water filtrate.....	Colorless, fragrant.	Yellowish brown, empyreumatic.	Yellow. empyreumatic.
Blue litmus.....	Faintly acid.	Distinctly acid.	Faintly acid.
Fe_2Cl_6 (solution).....	Green brown.	Greenish brown.	Pale brown.
Fe_2Cl_6 on dilution.....	Muddy.	Loses transparency.	Clear.
KCy (solution).....	Pink, intensified by AmHO.	No change.	No change.
Non-saponifiable bodies.....	64·47; red-brown, oily, odor unaltered.	16·12: similar to Russian.	36·54; pale brown, limpid, odor, terebinthinate.
Saponifiable bodies.....	16·57; black, consistence of lard, slightly empyreumatic.	19·84, black, sticky, resinous, strongly empyreumatic.	10·62; brown, semi-fluid, resinous, intensely empyreumatic.
Insoluble and vaporized below 100° C.....	18·96 per cent.	64·04 per cent.	52·84 per cent.

—*Phar. Jour. and Trans.*, March 21, 1885, p. 769.

Examination of Fats.—For this purpose Hübl regards only those methods as useful which are based on quantitative determinations, whether of chemical or physical nature. Such methods, which the author calls "quantitative reactions" afford valuable indications of the purity of fats as they are connected with their chemical constitution, qualitative tests are of value in doubtful cases and serve to control the conclusions drawn from the former. Of the three groups of acids present in fats, those belonging to the acetic acid series remain unaltered under ordinary conditions by haloids, while the acids of the oleic acid group take up two haloid atoms very readily, and those of the linoleic acid group four atoms. The author recommends

for this purpose an alcoholic solution of iodine in the presence of mercuric chloride, which acts on the unsaturated fatty acids at the ordinary temperature, the excess of iodine used being estimated with a solution of sodium thiosulphate. The percentage of iodine taken up is called the "iodine number." The following table is given by the author.

Oils.	Iodine number.	Fatty acid		Saponification value.	Solution in equal parts glacial acetic acid is rendered turbid at
		Melts at	Solidifies at		
1. *Drying oils.*		Deg.	Deg.		Deg.
Linseed	158·0	17·0	13·3	194·3	.....
Hempseed	143·0	19·0	15·0	193·1	.....
Walnut	143·0	20·0	16·0	196·0	.....
Poppy seed	136·0	20·5	16·5	194·6	.....
Pumpkin seed	121·0	28·0	24·5	189·5	108
Sesame	106·0	26·0	22·3	190·0	107
Cotton seed	106·0	27·7	30·5	195·0	110
Arachis	103·0	27·7	23·8	191·3	112
Rape seed	100·0	20·1	12·2	177·0	Insoluble.
2. *Non-drying oils.*					
Apricot kernel	100·0	4·5	0·0	192·9	114
Almond	98·4	14·0	5·0	195·4	110
Castor	84·4	13·0	3·0	181·0	Soluble in the cold.
Olive	82·8	26·0	21·2	191·7	85–111
Olive kernal	81·8	.....	.....	188·5	Soluble in the cold.
Bone oil	68·0	30·0	28·0	.....	.....
Lard oil	59·0	.....	.....	195·9	.....
Butterin	53·3	42·0	39·8	.....	.....
Palm oil	51·5	47·8	42·7	202·2	23·0
Laurel oil	49·0	27·0	22·0	.....	26·5
Tallow	40·0	45·0	43·0	196·5	95·0
Suet	36·0	41·8	40·0	170·0	.....
Cacao butter	34·0	52·0	51·0	.....	105·0
Nutmeg butter	31·0	42·5	40·0	.....	27·0
Butter fat	31·0	38·0	35·8	227·0	.....
Cocoanut oil	8·9	24·6	20·4	261·3	40·0
Japanese wax	4·2	.....	.....	222·0	.....

—*Dingl. Polyt. Jour.*, vol. 253, pp. 281–295; *Jour. Chem. Soc.*, 1884, p. 1435.

THE CHANGES OCCURRING IN BARLEY DURING MALTING, AND IN THE MANUFACTURE OF SPIRITS.

By P. Behrend

Removal of Organic and Inorganic Matter by Water.—The quality of the malt for brewing purposes is much influenced by the water in which it has been soaked, for if this water removes too much of the phosphates and potash, the yeast is unable to develop thoroughly; the water, regarded chemically, is not the only factor to be considered, attention must also be paid to the time of soaking and the temperature. The experiments were made on three varieties of barley, and it was noted that the largest percentage of material was removed from the smallest grains, due to the fact that the surface exposed to the water is relatively larger in the small than in the large grain. The author found that about one-half of the dry matter removed consisted of organic matter; this observation is directly opposed to that made by Mulder and Lermer, who found that the greater part of the extract consisted of organic matter. The practical outcome of the research is that barley must not be soaked too long else it will not germinate well, and the fermentation will be languid; more attention must be paid when small grained barley is malted than when the large sized is used.

The Changes which the Nitrogenous Matter undergoes.—The conversion of insoluble into soluble nitrogenous matter is very rapid, the soluble will increase six times by the end of nine days' malting. Hungarian and Saal barley were closely examined during malting, and analytical data are given showing the gradual conversion of albumin into soluble nitrogenous matter, the period of conversion extended over 209 hours; no free nitrogen was noticed. It was also found that the soluble nitrogenous matter did not consist wholly of amides, but that a part of the albumin became soluble without decomposition, and this the more rapidly, the quicker the malting—that is the formation of diastase—proceeded. Another piece of information gained of practical advantage is, that the length of the shoots is no indication of the extent to which the change of the albumin has gone.

Changes of the Albuminoids in Cereals and Potatoes when Heated under Pressure.—At high temperatures, the albuminoids are rendered soluble, amides being formed, consequently the feeding value of the waste products is much reduced; but, on the other hand, this conversion is no detriment to the growth of the ferment, which seems to

flourish equally well on albumins as on amides. When heated at 140° in Lintner's digester for six hours the albuminoids of lupines suffer much change; there was an increase of nearly double of the non-albuminoids whilst the albuminoid nitrogen soluble in water was increased by 13·9 per cent. In peas, soluble non-albuminoid nitrogen was increased from 35 to 87·8 per cent. and 36·6 per cent. of the insoluble albumin was made soluble. Maize and dari were also much affected. Experiments with potatoes showed that if they had been previously dried at 110°, a part of the albumin being thus rendered insoluble, the after heating by steam at a high temperature was incapable of restoring all the coagulated albumin to a condition of solubility. To ascertain whether working on the large scale produced the same effect on albuminoids, as the small laboratory experiments, maize and dari were heated in a Henze's steamer under a pressure of four atmospheres. The results obtained to a certain extent corroborated the original experiments, but the changes were not so marked. A short steaming dissolves the albumin, but long continued steaming converts the albumin into amides.—*Jour. Chem. Soc.*, May, 1885, p. 617; from *Bied. Centr.*, 1885, 51–56.

MINUTES OF THE COLLEGE.

PHILADELPHIA, June 29, 1885.

A stated meeting of the members of the Philadelphia College of Pharmacy was held in the Hall of the College, Monday, June 29, 1885, Charles Bullock, President, in the chair.

14 members present.

The minutes of the last meeting (March) were read and approved.

The minutes of the Board of Trustees for April, May and June, were also read and approved.

The following named gentlemen were elected delegates to the meeting of the American Pharmaceutical Association, to be held in Pittsburg in September next:

Alonzo Robbins, Wallace Procter, Joseph P. Remington, Gustavus Pile, Wm. P. Jenks.

Mr. Wm. McIntyre announced the death of G. W. Eldridge, a member of the College, which occurred suddenly on the 25th inst.

Mr. Alonzo Robbins presented the following report of the Delegates to the last meeting of Pennsylvania Pharmaceutical Association:

The undersigned, Chairman of the Delegation elected to attend the annual meeting of the Pennsylvania Pharmaceutical Association, respectfully reports as follows:

The meeting was held at Erie, commencing on the evening of June 2d. The Association was welcomed in a few words by the Mayor of the city,

who then introduced Dr. Evans, who delivered an eloquent address, which was appropriately responded to on behalf of the Association by Mr. I. H. Redsecker, of Lebanon.

Due to the fact that a large majority of the members of the Association reside in the central and eastern parts of the State, the meeting was not as numerously attended as usual, but in most other respects it was as successful as any held in previous years. Twenty original papers were read during the sessions, while the gain of a considerable addition to the membership in a part of our State in which the Association had hitherto been without any representatives, was alone sufficient proof of the wisdom of holding a meeting so far west.

Charles T. George, of Harrisburg, was elected President; James A. Meyers, of Columbia, and William L. Turner, of Philadelphia, were elected first and second Vice-Presidents.

The Association adjourned on Thursday morning, to meet at Lebanon on the second Tuesday of June, 1886.

On Thursday afternoon a steamboat excursion on Lake Erie was given, during which the U. S. Life Saving Station and other points of interest were visited. The festivities terminated in the evening with a banquet at Massassauga Point, from which the boat returned at an early hour in the midst of a tremendous rain storm.

Respectfully submitted,

ALONZO ROBBINS, *Chairman.*

June 29, 1885.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The Thirty-third Annual Meeting of this Association will be held in Lafayette Hall, in the city of Pittsburg, Pa., on the second Tuesday, the 8th of September, at 3 o'clock P.M.

Ample room has been provided at the City Hall for the exhibition of articles possessing pharmaceutical interest, and not prohibited by the rules of the Association. The exhibition room is in charge of the Local Secretary, Mr. George A. Kelly, Pittsburg, Pa., and will be ready for the reception of goods on Tuesday, September 1st.

All pharmaceutical organizations entitled to representation in this Association are invited to appoint delegates—five from each body—whose credentials should be sent to Prof. John M. Maisch, Permanent Secretary, Philadelphia, Pa., at least two weeks in advance of the meeting.

Applications for membership should be forwarded to Mr. George W. Kennedy, Pottsville, Pa.

Those who have accepted queries should send their replies to Prof. J. U. Lloyd, Cincinnati, Ohio, in advance of the meeting, that they may receive proper attention; this also applies to volunteer papers.

The Chairman of the Committee on Entertainment and Railroad Transportation will announce at the proper time such arrangements as have been made with the transportation companies for reduced fares, and also any programme which may have been devised for the social entertainment of the Association.

JOHN INGALLS, *President.*

Macon, Georgia, June 18, 1885.

MEETINGS OF STATE PHARMACEUTICAL ASSOCIATIONS.

With few exceptions all the State Pharmaceutical Associations have held their annual meetings, most of which have been well attended. As might have been expected, the local conditions of pharmacy and the trade interests formed conspicuous subjects for discussion, and among the latter the retailing of proprietary medicines at reduced prices was not unfrequently alluded to; but no suggestions were made at any one of the meetings, we believe, combatting that evil, which has done more than any other factor to lessen the scientific interest of pharmacists, and to degrade the practice of pharmacy to the level of mere buying and selling. It is to be noted that a number of papers were read counselling greater discrimination than heretofore in the selection of apprentices, in regard to their educational attainments and other qualifications; for the present these essays must be necessarily suggestive merely; but it is to be hoped that before long, ways will be found for putting into practice that which is theoretically conceded to be necessary and proper.

In the following we propose to give a brief account of the transactions at the various meetings, with a synopsis of some of the papers having scientific or practical interest.

ALABAMA.—The fourth annual meeting was held at Anniston, May 5th, and was mainly devoted to routine business. A. L. Stollenwerck, of Birmingham, was elected President; P. C. Candidus, of Mobile, Secretary, and E. P. Galt, of Selma, Treasurer. The next meeting will be held in Birmingham, on the second Tuesday of May, 1886.

CONNECTICUT.—The ninth annual meeting was held at Hartford, February 3.d. Papers on sodium salicylate, by C. H. Whittlesey, and on syrup of orange, by S. F. Guernsey, were read. The association will meet next year at New Haven, on the first Tuesday of February. The President for the current year is J. K. Williams, of Hartford; Secretary, F. Wilcox, of Waterbury; Treasurer, G. P. Chandler, of Hartford, and Local Secretary, Romanta Wells, of New Haven.

GEORGIA.—The tenth annual meeting assembled at Atlanta, April 14th. Among the papers read was one by R. H. Land, on the medicinal plants of Georgia; one by O. Butler, on a cheap disinfectant for the sick room, and one by Th. Schumann, on the manufacture of chemicals by pharmacists. Several prizes were awarded for essays read and for preparations made. H. G. Hutchinson was elected President; W. S. Parks, Secretary, and T. L. Massenburg, Treasurer.

INDIANA.—The fourth annual meeting was held at Indianapolis, May 12th and 13th. Among the papers read was one by Prof. R. B. Warder, on *qualitative analysis without using sulphuretted hydrogen;* in this scheme an excess of ammonium sulphide is used in the beginning for separating arsenic and allied metals in solution, the precipitate being treated with cold diluted hydrochloric acid, which leaves mercury, lead and allied metals undissolved, while iron and aluminium enter in solution. A paper by Jos. K. Lilly, on *standardizing pharmaceutical preparations*, advocates

such a plan for drugs the virtues of which depend upon alkaloids or resins. The *preparation of extracts for flavorings for soda water* was the subject of a paper by Leo Eliel; the *use of fluid extracts for tinctures*, by T. S. Motter; an *analysis of one thousand prescriptions*, by G. W. Sloan; *pharmacopœial tests*, by Prof. Hurty, and papers on trade interests, by L. Lybrand and D. Hilt. Aug. Detzer, of Fort Wayne, was elected President and Emil Martin and J. R. Perry, of Indianapolis, were re-elected Treasurer and Secretary. The next meeting will convene at Lafayette at the call of the Executive Committee; Dav. Hilt is Local Secretary.

IOWA.—The sixth annual meeting took place at Council Bluffs, May 12th, most of the time being occupied with routine business, and with discussions on the pharmacy law, and the liquor law as affecting druggists. Several brief notes were read by R. W. Crawford, advocating the *use of phosphoric acid* in the place of phosphorus for liquid mixtures; recommending the addition of *glycerin to extracts* inclined to become hard, and approving, under certain conditions, the use of *gelatin capsules for suppositories*. To the question, Should the pharmacists support those journals which *sell their columns for the use of quack nostrum advertisements?* there was an evasive answer given. Mr. F. E. Houghton found a mixture of equal parts of glycerin and water to be an available *solvent for tartrate of iron and potassium*, a solution of 10 grains to the fluidounce keeping unaltered for a month; but after 10 months it contained considerable sediment.

C. R. Wallace, of Independence was elected President, E. L. Boerner of Iowa City, secretary, and C. H. Ward, of Des Moines, Treasurer. Des Moines was selected as the place for the next meeting, to take place on the second Wednesday of February, 1886, and A. H. Miles was elected local Secretary.

KANSAS.—The sixth annual meeting convened in Lawrence June 10. Mr. Lucius E. Sayre, of Philadelphia, a graduate of the Philadelphia College of Pharmacy, who has recently been elected Professor of Pharmacy in the new pharmaceutical school connected with the University of Kansas, was present and read a paper on *pepsin*. Papers were also read on the presence of *carbolic acid in commercial salicylic acid*, by H. W. Mehl; on *nitrous ether*, by R. H. T. Nesbit; on *morphine strength of laudanum*, by M. Schott, and on *fungous growths in aqueous solutions*, by R. J. Brown.

H. W. Spangler, of Perry, was elected President, J. T. Moore, of Lawrence, Secretary, and C. D. Barnes, of Abilene, Treasurer. Emporia will be the next place of meeting on the second Wednesday of June, 1886; the local Secretary is D. W. Morris.

KENTUCKY.—The eighth annual meeting was held at Danville, May 20, and was devoted to routine business and the consideration of further pharmaceutical legislation. Papers were read on *adulterations*, by H. W. Evans, on *citrine ointment*, by O. Gier; on *explosive mixtures*, by E. C. Pfingst, on *quinine pills*, by G. A. Zwick, and on *arsenic*, by Jeff. Oxley. H. W. Evans, of Danville, was elected President, J. T. Cook, of Harrodsburg, Secretary, and J. J. Brooks, of Richmond, Treasurer.

The place of the next annual meeting is Bowling Green; the time has been fixed for the first Wednesday in May, 1886. Wm. Turner is the local Secretary.

LOUISIANA.—The third annual meeting was held at New Orleans, May 27. Five papers were read, one being on the use of the microscope, and another on unofficinal formulas. Mr. Chas. Mohr, of Mobile, was elected an honorary member. The officers for the current year are: A. R. Finlay, President, L. C. Chalin, Secretary, and J. B. Lavigne, Treasurer. The next meeting will again be held in New Orleans, on the third Wednesday of April, 1886.

MARYLAND.—The third annual meeting was held at Hagerstown, May 12 and 13. No report of the transactions has been received.

MASSACHUSETTS.—The fourth annual meeting convened in Pittsfield, June 3 and 4. The following papers were read: *Books and methods of study for pharmacists*, by Prof. E. L. Patch, *new chemicals and pharmaceutical preparations*, by F. A. Davidson; *tinting of morphine salts*, with an aniline color for the purpose of preventing their being mistaken for quinine, by W. C. Durkee; *incompatibility in prescription*, by Prof. Markoe; on the *sale of opiates to habitual opium eaters*, by W. W. Hill, who urged that the sale be discouraged; *test for oleomargarin*, by W. W. Bartlett, recommending Hehner's method and limiting the maximum amount of fatty acids of pure butter to 90 per cent; on *tincture of ginger*, by S. A. D. Sheppard, arriving at the result that a tincture or fluid extract, having the full medicinal effect of ginger cannot be prepared so as to mix with water without precipitation; *pharmaceutical notes*, by J. W. Colcord. Discussions were also had on several practical questions.

The present officers are F. M. Pease, of Lee, President, J. W. Colcord, of Lynn, Secretary, and F. H. Butler, of Lowell, Treasurer. The Association adjourned to meet in Boston on the first Wednesday of June, 1886, Henry Canning acting as local Secretary.

MINNESOTA.—The annual meeting was adjourned from the 9th to the 16th and 17th of June, so as to take place in the same week in which the State Medical Association convened in St. Paul.

MISSISSIPPI.—The second annual meeting was held at Natchez, May 19th. After considerable discussion a committee was appointed for preparing a law which is to be presented to the next Legislature for enactment. Dr. J. B. Bond read a paper on *tinting morphine*, with the view of preventing its being mistaken for quinine. The officers for the present year are J. P. Finlay, of Greenville, President; H. F. West, of Fayette, Secretary, and W. R. Bunning, of Natchez, Treasurer. The next meeting will be held at Jackson on the third Tuesday of May, 1886.

MISSOURI—The seventh annual meeting took place at Sweet Springs, June 16 and 17, when papers were read by Prof. Curtman on *tests for purity of quinine*; by Prof. Wall on *how to study drugs*; by G. H. C. Klie on the advantages of *making tinctures by percolation*, and another entitled *miscellaneous notes*; by Prof. Good on *authoritative non-official formulas*; by F. G. Kerr on *syrup of tolu*, and by Dr. Bond on *tinting morphine*. Dr. Bond was elected an honorary member. A movement was inaugurated aiming at interstate meetings of the Pharmaceutical Associations of Iowa, Kansas, Missouri and Nebraska.

The next meeting will again be held at Sweet Springs, the time being the third Tuesday of June, 1886. A. T. Fleischman, of Sedalia, is Presi-

dent for the current year; G. H. C. Klie, of St. Louis, Secretary, and Prof. Good, Treasurer.

NEBRASKA.—The fourth annual meeting assembled at Omaha, May 13 and 14. A paper on *syrup of the hypophosphites* of calcium, sodium, quinine and manganese was read by N. A. Kuhn. Omaha was again selected as the place for holding the annual meeting, and the time was fixed for the second Tuesday of May, 1886. The officers elected are H. D. Boyden, of Grand Island, President; F. P. Zimmer, of Grand Island, Secretary; J. Forsythe, of Omaha, Treasurer, and C. J. Daubach, Local Secretary.

NEW JERSEY.—The fifteenth annual meeting convened in Camden, May 20 and 21. There are now 1,191 registered pharmacists in the State. The draft of an amended pharmacy act was carefully considered and referred to a committee for presentation to the Legislature. Three or four papers were read urging to provide for a good primary education of those contemplating to become apprentices in pharmacy. A paper by Aug. Drescher on *sediment in infusion of digitalis*, showed that the sediment contained digitalin, and it was stated that such an infusion deprived of the sediment, had on several occasions been found to produce no effect, and that the flavor of cinnamon might preferably be imparted by the volatile oil, instead of the bark. Attention was also drawn to the fact that in Europe the leaves collected from plants grown on mountains have been shown to be more efficacious than those grown in valleys or collected from cultivated plants, the latter being decidedly less hairy. An occasional *offensive odor of simple syrup* was traced by Aug. Drescher to sulphuretted hydrogen produced from the ultramarine, which is used for neutralizing the yellow tint of inferior grades of sugar. In a paper on *syrup of tolu* A. Drescher agrees with the views of E. Claassen, but thinks that as a flavoring syrup it is a failure and that it should be dropped from the Pharmacopœia; to obtain the medicinal effects of tolu, it should be given in emulsion. A paper on *incompatibles*, chemical and physiological, by P. E. Hommell, and one entitled *random notes*, treating of various practical subjects, by H. P. Reynolds were also read. The last named paper gives the following formula for *Pulvis morphinæ acetatis compositus*, which has been long prescribed in Plainfield; morphine acetate 1 gr., camphor 2 gr., ipecac 4 gr., precipitated calcium carbonate 12 gr., and sugar 21 gr. The officers elected were W. M. Townley, of Newark, President; R. H. Vansant, of Trenton, Secretary, and W. Rust, of New Brunswick, Treasurer. The Association will meet next in Newark on the third Wednesday of May, 1886.

NEW YORK.—The seventh annual meeting was held in Saratoga, June 16, 17 and 18. The following papers were read in full, besides a number which were read by title: on *unofficinal formulas* by S. J. Bendiner, making suggestions for increasing those published in the New York and Brooklyn formulary; on *soap liniment* by W. P. De Forest, suggesting a weaker alcohol as menstruum so as to render the liniment more stable; on *botanical knowledge* required by pharmacy boards, by the same author; on *spirit of nitrous ether* by Dr. Eccles; on *pharmacy laws* and on the *merchandise* in a pharmacist's stock by A. C. Searles; on the comparative

value of *red and white wines* as applied to the pharmacopœial requirements by Prof. Bedford, and on *medicinal syrups* by C. W. Holmes.

The President for the present year is T. J. Macmahan, of New York; Secretary C. W. Holmes, of Elmira, and Treasurer C. H. Butler, of Oswego. The Association adjourned to meet in Rochester on the second Tuesday of June, 1886.

OHIO.—The seventh annual meeting assembled in Sandusky, May 20 and 21. The business transacted was mostly of a routine nature. Twenty papers were presented, but only few of them could be read during the meeting. A paper on *commercial belladonna leaves* by Prof. Coblentz reported the assays of 14 samples, namely 8 of American pressed leaves, which yielded between ·0020 and ·0433 per cent. of pure alkaloid; 4 samples of loose German leaves yielded between ·0109 and ·0420 per cent., and 2 samples of English leaves ·0411 and ·0422 per cent. of pure alkaloid. The alkaloid was extracted from the concentrated tincture containing tartaric acid, with chloroform, and purified by precipitation with iodine, treatment with sodium thiosulphate and solution in chloroform.

Unguentum Hydrargyri nitratis, by H. C. Cook. Made with lard oil, heated with the nitric acid to 50°C., and slowly raising the heat to 70°C., the ointment retained its bright color for a long time; made with petrolatum in various ways the ointment acquired a dark color, and was less efficient than the officinal article.

Commercial black antimony. Examined by S. W. McKeown, the cheap grades were found to be coal dust mixed with marble or other substance, and with or without a little sulphide of antimony.

Commercial precipitated sulphur. Of seven samples S. W. McKeown found one to be pure; the others contained about half their weight of calcium sulphate.

Commercial iodine. Eleven samples examined by Miss H. M. Spenzer contained between 96·5 and 99·1 per cent. of pure iodine.

Tinctura opii deodorata. Two papers were presented by Ph. Acker and by Prof. Coblentz, both reporting that petroleum benzin, while it removes from opium odorous and other principles, does not dissolve the narcotine. Prof. Coblentz found 10 gm. of opium to yield to ether 0·307 gm., and to benzin 0·158 gm., the difference between the two figures being narcotine.

Pills of nitrate of silver. T. Daniels recommends as the best excipient a mixture of petrolatum 1 part, with kaolin 2 parts.

Powdered capsicum, according to S. W. McKeown, should yield about 28 per cent. of alcoholic extract, and on incineration about 4·5 per cent. of white ash. If adulterated with corn meal, a smaller amount of alcoholic extract and a larger amount of ash is obtained, the latter being red or brown, probably due to ochre used for coloring.

Commercial tartaric acid was found by C. M. Reed to contain a minute amount, ·068 per cent., of adhering sulphuric acid.

Baking powder. S. W. McKeown recommends a satisfactory article, to be made of cream of tartar 7 parts, sodium bicarbonate 3 parts and starch 3 parts.

The subjects of other papers were pancreatin as an emulsifying agent,

volatility of camphor, fluid hydrastis, aniline dyes, commercial hydrobromic acid, disinfectants, syrup of tolu, pill manufacture and removal of glass stoppers.

The officers elected were W. M. Melville, of Sandusky, President; L. C. Hopp, of Cleveland, Secretary, and Chas. Huston, of Columbus, Treasurer. The next meeting will take place at Springfield, on the first Wednesday in June, 1886, Chas. Ludlow being Local Secretary.

PENNSYLVANIA.—The eighth annual meeting convened at Erie, June 2d, and adjourned June 4th. Twenty papers were read, eight of which related to ethical questions and trade interests. A very valuable paper on *drug store insurance*, by M. N. Kline, showed that the premium for insurance differs considerably, and is almost without exception much higher than for other merchandise, while the losses by fire were shown to be too small to warrant the classification of such stock as "extra hazardous."

Sulphuric acid, by Gust. Pile. An acid containing 96 per cent. of H_2SO_4 approaches in density nearly to 1·835, which coincides with the gravity adopted by the oil of vitriol makers. Nitrous acid, N_2O_3, is soluble in strong sulphuric acid, and in case of full saturation increases the density to 1·860. Nitric acid and mineral impurities do not materially affect the density. The paper describes, also, the Glover tower, which has been recently introduced for the manufacture of sulphuric acid.

Aqua ammoniæ, by G. W. Kennedy. Thirty-six samples were examined, and with very few exceptions were found to be of the required standard; the few cases of deficiency of strength could be traced to careless handling and keeping in small quantities in large vessels.

Lithium salts. J. W. Miller finds that the benzoate, citrate and salicylate could be readily prepared by the pharmacist so as to afford a handsome profit; but, owing to the small quantity used, this plan would not be economical. Home manufacture is, however, advocated for pharmaceuticals generally.

Benzoin.—F. H. E. Gleim has obtained from four samples of benzoin not over 1¾ per cent. of benzoic acid, and by sublimation much less; variety and quality of the sampies are not described.

Fixed oil of ergot.—J. H. Redsecker ascertained that the powder left in the preparation of fluid extract of ergot by the officinal process, yields with benzin an oil which is identical in appearance and properties with the oil prepared from the unexhausted drug. It was stated that the oil obtained from the commercial powdered ergot has a dark color, probably due to the heat used for drying the ergot, while the pure oil is pale yellow or nearly colorless.

Orange flower water.—J. L. Lemberger showed that orange flowers gathered in Florida, salted, and after four months distilled, yielded a very good water.

Powdered extracts.—Ch. T. George showed that the extracts of colocynth, calumba, krameria and opium may be powdered without adding a diluent. To other extracts he added potato starch, in the proportion of 15 per cent. to drugs exhausted by alcohol, and 25 per cent. to drugs exhausted with diluted alcohol. With proper care such extracts will remain in a good, dry condition for years.

Bile, though not much used, is regarded by J. F. Patton as possessing sufficient value to merit the space accorded to it in the pharmacopœia.

Pills of phosphorus, properly made and kept in a dry place were found by C. F. Randolph to remain in good condition and to evolve white vapors when cut after a year; if kept in the cellar the pills became soft and mouldy. The best coating for such pills seems to be gelatin.

The use of fluid extracts for making other pharmaceutical preparations was discussed by C. T. George who regards the practice as neither professional nor legitimate.

The pharmacopœial standard for pharmaceutical preparations was stated by G. W. Stoeckel to be adhered to by fully eight-ninths of the pharmacists of Pennsylvania, as far as strength is concerned, though other than pharmacopœial processes are often followed. Fluid extracts and some other preparations were stated not to be made by pharmacists as generally as desirable. Many preparations put up for the country trade were often found to be very deficient.

A paper on products from the natural order of *Verbenaceæ* is published on page 330.

After the report on adulterations had been read, Prof. Maisch called attention to two substitutions lately observed by him in this country, namely, *spurious cubebs*, of which a considerable quantity appears to be in our market (for characters see page 353), and *false sumbul*, the root of Dorema Ammoniacum, which is of a closer texture, firmer and denser than sumbul, of a decided yellow color internally and of a feeble musk odor superficially, imparted by dipping the pieces into a soft extract of sumbul.

The president for the current year is Chas. T. George, of Harrisburg. Dr. L. Wolff, having retired from the drug business and accepted the appointment as Demonstrator of medical chemistry and toxicology in the Jefferson Medical College, declined the nomination as one of the executive officers, and J. A. Meyers, of Columbia, and Wm. L, Turner, of Philadelphia, were elected Vice-presidents. Dr. J. A. Miller, of Harrisburg, was re-elected Secretary, and J. L. Lemberger Treasurer. The next meeting will be held at Lebanon, with G. R. Ross as local Secretary.

TEXAS.—The sixth annual meeting convened in San Antonio, May 13th, the deliberations extending over two days. Routine matter, pharmacy law, renewal of physicians prescriptions and similar subjects formed the topics for discussion, and papers were read by J. W. Graham on *spirit of nitre*, and by G. S. Richardson on the bark of Sambucus canadensis. The President elected is G. H. Kalteyer, of San Antonio; Secretary G. Rice, of San Antonio; Treasurer E. W. Lancaster, of Marshall, and G. A. Eisenlohr was elected local Secretary, Dallas being chosen as the place for the next meeting, the date to correspond with the meeting of the Medical Association at the same place.

VIRGINIA.—The fourth annual meeting was held at Charlottesville, May 19 to 21. The reading of reports and of several papers, discussions on pharmaceutical legislation and various practical questions, and routine business claimed the attention of the members. J. W. Thomas, Jr., of Norfolk, was elected President, E. R. Beckwith, of Petersburg, Secretary,

and F. H. Masi, of Norfolk, Treasurer. The next meeting will convene in Alexandria, on the second Tuesday in May, 1886.

WEST VIRGINIA.—The fifth annual meeting assembled in Grafton, June 9. The reports of officers and committees and several papers were read and discussed. J. A. Grant, of Grafton, was elected President, and C. Menkemeller, of Wheeling, Secretary and Treasurer. The next meeting will take place at Wheeling, on the second Tuesday of June, 1886.

EDITORIAL DEPARTMENT.

PHARMACEUTICAL LEGISLATION.—During the present year pharmacy laws have been enacted in four States, in which heretofore the practice of pharmacy had not been regulated by law, namely, Kansas, Massachusetts, Michigan and Minnesota. These laws are similar to those which are in force in other States, and, properly carried out, will prevent grossly incompetent persons from entering a business in which knowledge, skill and prudence are the real safeguards of the customers.

It is known that the existing pharmacy laws, notwithstanding their general similarity, show little uniformity in some important points, and the same holds good also for the new laws. While, for instance, in Minnesota graduates of any medical school are lawfully capable of conducting a pharmaceutical business, the board is empowered to discriminate between the schools of pharmacy, the same as in Kansas; but, in the latter State, graduates in medicine have not the prerogative conferred upon them by law to become pharmacists without having had pharmaceutical experience. In Michigan, on the other hand, no diploma is recognized, but licentiates of other boards may be registered without examination.

Other differences are found in the manner of selecting the board, in the examining fees, in the annual registration fees, in the poison clauses, the qualification of assistants, etc.

Maine has had a pharmacy law since 1877, which, notwithstanding several defects, has been well administered. The commissioners, knowing these defects, had framed an amended bill and presented it with their official annual report. Without their knowledge, however, a bill was passed by the Legislature, and approved March 6, 1885, in which most, if not all, the objectionable features are retained and others, still more objectionable ones, have been legalized. The commissioners appointed by the Governor must, as in the old law, be *suitable persons*, but wherein their suitability is to consist is not stated. While every applicant for registration is apparently required to submit to an examination after presenting satisfactory evidence of having three years' experience, or being a graduate in medicine or in pharmacy, and in addition thereto that he is competent for the business; exceptions are made in favor of practising physicians who may do the business of an apothecary *without being registered*, and in favor of those who were engaged in the business March 11, 1877, and *hereafter* enter on the business of an apothecary, they being dispensed from the examina-

tion. Another curious clause is the one allowing any person to enter upon the business of an apothecary *without registration*, provided he does not personally do the duties of an apothecary, but employs a registered apothecary.

The struggles for pharmacy laws in some of the States have lasted for a number of years; but while in Massachusetts they have come to a successful issue, even though the law be not as perfect as might be desired, in other States the attempts have again failed. The bill which was before the Pennsylvania Legislature was at first burdened with amendments not germane to its objects, as for instance the prohibition of renewing prescriptions without the physician's written order, and after these failed, the bill secured a majority of 93 against 77 in the House, but failed for the want of the constitutional majority.

It may be mentioned yet that the Kansas pharmacy law makes the apothecary the custodian of the original prescription; likewise that prosecutions under the pharmacy acts in Philadelphia, New Jersey, Illinois and other States resulted in the conviction of the offenders, and that in those cases in which appeals were taken, the validity of the law was sustained by the higher tribunals.

OBITUARY.

FERDINAND HASSENCAMP, a prominent pharmacist of Baltimore, died in that city, April 29. He was a native of Marburg, Hesse-Cassel, where he was educated, and has been a resident of Baltimore for over thirty years. He took great interest in the Maryland College of Pharmacy, and served faithfully as Director and Examiner of this institution; he was also a member of the Board of Pharmacy and of the American Pharmaceutical Association, took an active part in the management of many charitable institutions and social societies, and secured a large circle of friends who valued him for his amiability in social intercourse and for his worth as a man.

Notice of the death of the following graduates of the Philadelphia College of Pharmacy has been received:

CHAS. S. LEE, class 1870, died in Philadelphia, of apoplexy, April 1, aged 37 years.

HORACE H. OWEN, class 1880, in business in Philadelphia, died at York, Pa., of typhoid fever, April 9.

FRED. LOOSE, Jr., class 1880, was drowned in the Schuylkill river, near Philadelphia, June 17, at the age of 25 years.

ARTHUR E. LEWIS, class 1880, of Scranton, Pa., died at Santa Barbara, Cal., April 1, of consumption, aged 25 years.

JOHN G. SEITZ, class 1882, died at Cleveland, Ohio, June 21, after a lingering illness.

GEORGE W. ELDRIDGE, class 1863, in business in Philadelphia, died suddenly of heart disease, June 25, 1885.